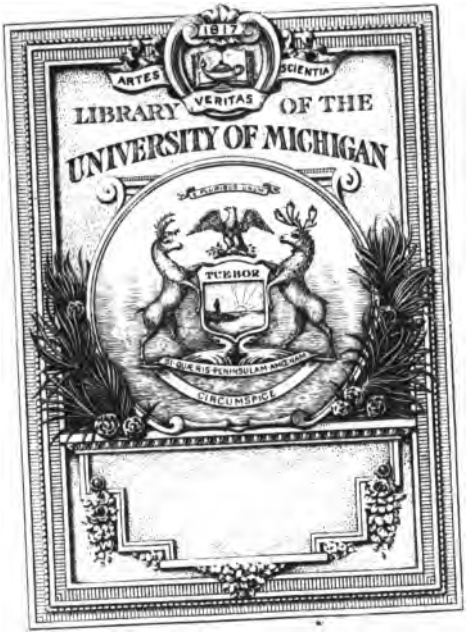

CATALOGUE

OF THE

FOSSIL FORAMINIFERA

IN THE

BRITISH MUSEUM,

(NATURAL HISTORY)

CROMWELL ROAD, S.W.

LONDON:
PRINTED BY ORDER OF THE TRUSTEES.
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BY

PROFESSOR T. RUPERT JONES, F.R.S., F.G.S., &c. &c.

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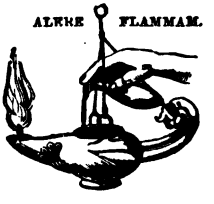

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RED LION COURT, FLEET STREET.

PREFACE.

THE Foraminifera, widely distributed in the seas of to-day, enter so largely into the composition of the stratified rocks, forming in many places such vast thicknesses of limestone, as necessarily to claim the attention of the Geologist and Palæontologist.

This Catalogue, prepared by Prof. T. Rupert Jones, F.R.S., one of our best authorities on this group of organisms, does not pretend to be a complete or exhaustive one, but is designed to show the present state of the collection of Fossil Foraminifera in the British Museum.

In addition to the lists of genera and species, much valuable information has been added by the author as to the classification and distribution of the Foraminifera, both in time and space; a short account is also given of the structure and mode of growth of existing forms.

It is hoped that, in addition to its utility to Museums and Private Collectors, this Catalogue may be the means of largely increasing the extent and usefulness of the National Collection.

HENRY WOODWARD.

British Museum,
(Natural History)
Department of Geology,
March 20, 1882.

INTRODUCTION.

THE FORAMINIFERA are small shelled animals, mostly microscopic, of simple organization, and of very various forms. Their shells are frequently delicate in structure and elegant in shape. In size there are many less than $\frac{1}{60}$ inch in diameter; but there are some among the discoidal *Nummulites* and *Orbitoides* that attain a breadth of more than 2 inches; so also the spherical *Parkeria*; whilst the fusiform *Loftusia* is found to be more than 3 inches long; and *Eozoon* has been estimated to cover a square foot, with a thickness of 5 or 6 inches. Their shells consist of carbonate of lime.

They are found, often abundantly, in sea-sand, both of the shore and of shallow and deep waters; also in the abyssal ooze of the great oceans. They are important components in many limestones that have been formed of calcareous mud, shell-beds, coral-reefs, &c., in successive oceans at different ages of the world; and they abound in many clays, which have been the silts of ancient seas.

Studied in the living state, Foraminifera are seen to consist of a glairy, white-of-egg-like substance, filling the shell, whether it be simple or compound—that is, whether composed of one or of many chambers. This is extruded also, as delicate fine threads, either from one mouth-like aperture (as in *Miliola*), from several marginal holes (as in *Peneroplis*), or from numerous pores all over the shell (as in *Rotalia*); and similar filaments proceed from a layer of this soft material thrown back over the shell in some instances.

This living gelatinous substance is called *sarcode*; and the emitted threads are termed *pseudopodia*. These being retractile and used for locomotion, the creatures are said to belong to the *Rhizopoda*.

The pseudopods generally interlace one with another, forming an irregular network at some distance from the shell. Hence the Foraminifera are grouped in classification as the *Reticularia*. The segments of sarcode

in the successive chambers of the shell are produced by one or more *stolons*, forming short cords, by which the segments are connected, and for which a space or aperture is left in the wall of each chamber as each new mass of sarcode is coated with shell-matter, either by the internal mass or by the overlying layer—in the latter case, after the mode observable in the shell-secreting outer mantle of *Cyprœa* and such-like mollusks. The pseudopodial pores also are left open by this external shell-forming layer, as in *Polystomella*, except where they become interrupted, as, for instance, at the margin of the shell, or where the divisions or septal walls of successive chambers, or alar flaps, cross one another, as in *Nummulites*. This shell-growth also produces, in some instances, tubercles and ridges, as in *Nodosaria*; and, in some thick- or double-walled chambers, canals or vascular hollows are left for an intermediate system of sarcode threads, finding their way to the surface from the inside, as in *Calcarina* and others.

Those Foraminifera which have perous or tubuliferous shells, such as most of the above-mentioned kinds, are termed *Perforata*; and, having often a subtranslucent and shining shell, they are also termed *Hyalina* or *Vitrea*.

Some Foraminifera secrete an opake, homogeneous, white, calcareous shell, each chamber of which is laid on, tent-like, over its segment of sarcode, the edges resting on the last, or some previously-formed, portion of the shell. Being without pseudopodial tubules, these are termed *Imperforata*, and, from the solid white appearance of their shell-tissue, *Porcellanea*.

In these the sarcode protrudes either through one large terminal aperture (as in *Miliola*), or through a series of small holes at the edge of a more or less discoidal compound shell, made up of concentric rings, sometimes divided into chamberlets (as *Orbiculina*), or consisting of circles of small chambers (as *Orbitolites*).

Some kinds of Foraminifera (such as *Lituola*) always mix up grains of sand, minute shells, or other extraneous particles with their calcareous coating. These are termed *Arenacea*. But some of the hyaline and perforate kinds, such as *Bulimina*, become coarser and take up sand-grains in their shells as they grow old. So also some of the porcellaneous *Miliolæ* become sandy under certain conditions. Therefore the Arenaceous Foraminifera do not form so distinct a natural group as the others; and, indeed, all three groups have interlinkings in this and in other respects.

There are also Foraminifera that select sponge-spicules as the extraneous materials of their tests, either with or without other foreign particles.

It is possible that some of these may have somewhat chitinous coverings

—that is, limp tough tests consisting of some material analogous to chitine. *Ceratestina* has such a horny coat, but is one of the lobular or *Testamœbiform* Foraminifera as defined by Carter *.

On account of the reticularian character of their pseudopods, the more or less chitinous *Gromia*, *Shepheardella*, and *Lieberkuehnia* are grouped with Foraminifera; but these differ somewhat from ordinary kinds of this Order of Rhizopods †. Even some of the *Miliolæ* are found at times with a chitinous test, destitute of calcareous matter, and occasionally incrusted with sand.

None of these soft-shelled Rhizopods are found in the fossil state, unless, indeed, some thread-like markings on weathered chalk-flints indicate the former existence of soft filiform sarcodic bodies once present in the calcareous mud before it was replaced by silex in the process of pseudomorphosis.

The following classification of Foraminifera is adapted from the Table in H. B. Brady's "Notes on Reticularian Rhizopoda," &c. in the Quart. Journ. Micr. Sci. new series, vol. xxi.

Division A. **IMPERFORATA.**

Subdivision 1. CHITONACEA.

Group I. Test chitinous, imperforate.

Fam. I. **Gromidæ.**

Gromia, Dujardin; *Lieberkueknia*, Claparède; *Shepheardella*, Siddall.

Subdivision 2. CALCAREA (Porcellanea).

Group II. Test calcareous, imperforate, porcellaneous, and sometimes sandy, occasionally chitinous and sandy.

Fam. II. **Miliolidæ.**

a. Miliolina.—*Bathysiphon*, G. O. Sars; *Squamulina*, Schultze; *Nubecularia*, Defrance; *Uni-*, *Bi-*, *Spiroloculina*, d'Orb.; *Miliola*, Lamarck (*Miliolina*, Williamson; *Tri-*, *Quique-*, *Cruciloculina*, d'Orb.); *Cornuspira*, Schultze (*Ophthal-*

* Ann. & Mag. Nat. Hist., June 1880, p. 446 &c.

† For Mr. Siddall's very interesting and instructive notes on *Lieberkuehnia* and *Shepheardella*, see the Quart. Journ. Micr. Sci. 1880, p. 141 &c.

midium, Kübler); *Nummoloculina*, Steinmann; *Hauerina*, d'Orb.; *Vertebralina* d'Orb. (*Articulina*, d'Orb.); *Fabularia*, Defr.

b. Orbitolitina.—*Peneroplis*, de Montfort; *Orbiculina*, Lamarck; *Orbitolites*, Lam.; *Alveolina*, d'Orb.

c. ? Dactylopora.—*Ovulites*, Lamarck; *Dactylopora*, Lam.

Subdivision 3. ARENACEA.

Group III. Test calcareous and arenaceous.

Fam. III. **Astrorhizidæ.**

Psammosphæra, Schulze; *Sorosphæra*, Brady; *Saccammina*, M. Sars; *Pilulina*, Carpenter; *Storthosphæra*, Schulze; *Technitella*, Norman; *Pelosina*, Brady; *Aschemonella*, Brady; *Astrorhiza*, Sandahl; *Dendrophrya*, Str. Wright; *Rhabdammina*, M. Sars; *Jaculella*, Brady; *Hyperammina*, Brady; *Psammatodendron*, Norman (MS.); *Sagenella*, Brady; *Botellina*, Carpenter; *Marsipella*, Norman; *Haliphysema*, Bowerbank; *Polyphragma*, Reuss.

Fam. IV. **Lituolidæ.**

(These comprise sandy isomorphs of the simpler types of the *Hyalina*, such as *Lagena*, *Nodosaria*, *Globigerina*, *Rotalia*, *Nonionina*, &c.)

Lituola, Lamarck (*Reophax*, de Montfort; *Haplophragmium*, Reuss; *Haplostiche*, Reuss; *Placopsilina*, d'Orb.; *Bdelloidina*, Carter); *Trochammina*, Parker and Jones (*Hormosina*, Brady; *Ammodiscus*, Reuss; *Webbina*, d'Orb.); *Nodosinella*, Brady; *Involutina*, Terquem; *Endothyra*, Phillips; *Stacheia*, Brady; *Thurammina*, Brady; *Hippocrepina*, Parker; *Cyclammina*, Brady.

Fam. V. **Parkeridæ.**

Parkeria, Carpenter; *Loftusia*, Brady.

Division B. **PERFORATA** (**Vitrea** vel **Hyalina**).

Group IV. Tests of many of the larger forms arenaceous, with more or less of a calcareous perforate basis; smaller forms hyaline and perforate.

Fam. VI. **Textularidæ.**

a. Textularina.—*Textularia*, Defrance (*Bigenerina*, d'Orb.; *Pavonina*, d'Orb.; *Spiroplecta*, Ehrenberg; *Cuneolina*, d'Orb.); *Verneuilina*, d'Orb. (*Gaudryina*, d'Orb.; *Chrysalidina*, d'Orb.; *Tritaxia*, Reuss); *Valvulina*, d'Orb. (*Clavulina*, d'Orb.).

b. Buliminina.—*Bulimina*, d'Orb. (*Virgulina*, d'Orb.; *Bolivina*, d'Orb.; *Pleurostomella*, Reuss).

c. Cassidulinina.—*Cassidulina*, d'Orb.; *Ehrenbergina*, Reuss.

GROUP V. Test calcareous, finely perforate.

Fam. VII. **Chilostomellidæ.**

Chilostomella, Reuss; *Allomorphina*, Reuss; *Ellipsoidina*, Seguenza.

Fam. VIII. **Lagenidæ.**

a. LAGENINA.—*Lagena*, Walker and Jacob; *Ramulina*, Jones; *Nodosaria*, Lamarck (*Glandulina*, d'Orb.; *Dentalina*, d'Orb.; *Lingulina*, d'Orb.); *Frondicularia*, Defr.; *Vaginulina*, d'Orb. (*Rimulina*, d'Orb.; *Rhabdogonium*, Reuss); *Marginulina*, d'Orb.; *Cristellaria*, Lam. (*Planularia*, Defr.); *Flabellina*, d'Orb.

b. POLYMORPHININA.—*Polymorphina*, d'Orb. (*Dimorphina*, d'Orb.); *Uvigerina*, d'Orb. (*Sagrina*, d'Orb.).

GROUP VI. Test calcareous, generally with coarse perforations; without canal-system.

Fam. IX. **Globigerinidæ.**

Globigerina, d'Orb. (*Orbulina*, d'Orb.); *Pullenia*, Parker and Jones; *Sphæroidina*, d'Orb.; *Candeina*, d'Orb.

GROUP VII. Test calcareous, coarsely perforate; some with double chamber-walls and interseptal canals.

Fam. X. **Rotalidæ.**

Spirillina, Ehrenb.; *Patellina*, Williamson; *Discorbina*, P. & J.; *Planorbulina*, d'Orb. (*Truncatulina*, d'Orb.; *Anomalina*, d'Orb.); *Rupertia*, Wallich; *Carpenteria*, Gray; *Polytrema*, Risso; *Tinoporus*, Carpenter (*Gypsina*, Carter); *Cymbalopora*, von Hagenow; *Pulvinulina*, P. & J.; *Rotalia*, Lamarck; *Calcarina*, d'Orb.

GROUP VIII. Test calcareous, very finely tubulated; all the higher forms with a system of interseptal canals.

Fam. XI. **Nummulinidæ.**

a. POLYSTOMELLINA.—*Nonionina*, d'Orb.; *Polystomella*, Lam.

b. NUMMULITINA.—*Archædiscus*, Brady; *Amphistegina*, d'Orb.; *Fusulina*, Fischer; *Eozoön*, Dawson; *Cycloclypeus*, Carpenter; *Heterostegina*, d'Orb.; *Operculina*, d'Orb.; *Nummulites*, Lamarck (*Assilina*, d'Orb.).

Unplaced groups :—

GROUP IX. **Testamœbiformia,** Carter. Lobose forms.

a. Test calcareous.—*Holocladia* and *Cysteodictyina,* Carter.

b. Test chitinous.—*Ceratestina,* Carter.

GROUP X. **Syringosphæridæ,** Duncan. Test calcareous, with radiating groups of tubules.

Syringosphæria and *Stoliczkaria,* Duncan.

GROUP XI. **Receptaculitidæ,** Gümbel. Test calcareous, consisting of an inner and an outer floor of plates, connected by the tubes of an anastomosing canal-system.

Receptaculites, Defrance; *Ischadites,* König; *Tetragonis,* Eichwald; *Sphæronites,* Hisinger; *Sphærospongia,* Salter.

In the foregoing Table the names given in parentheses indicate, for the most part, not synonyms, but *subgeneric* relationships, so far as such grouping can be admitted where even many of the "genera" are artificial and not of more value *zoologically* than "species" in higher orders of animals. In this infinitely variable Order, so little is known of any real differentiation of the sarcode, or of its physiology, that there remain but few characters and features of essential value to guide in its classification. Besides the investing and the pseudopodial sarcode, of which so little can be learnt, there are only the tissue, form, and structural peculiarities of the shell for discrimination; and these present very many gradational phases, not only among individuals of any one related group, but between the great groups themselves. Thus much uncertainty accompanies the special naming of any series of fossil Foraminifera, or any series of recent forms from a new or little-known dredging-ground; for, on zoological principles, they might fall into generic and specific groups already known and named; whilst, for the sake of convenience in definitely noting the somewhat divergent (though closely related) new varieties, the collector might wish to apply new distinctive names.

In choosing among the numerous names already given to notable varieties, it is not always possible to preserve uniformity; for two nearly allied, but slightly different, forms may sometimes be noted under one name and sometimes under two or more names given by previous writers, as opportunity or convenience may guide.

It is very necessary therefore to have the local groups of Foraminifera before the eye, rather than to have to search here and there for the members of those groups. Moreover the general characters, aspect, or *facies* is striking enough to a palæontologist, although the slightly different varietal forms cannot be fairly distinguished by names; for every individual specimen in some such groups might have a separate name. Indeed many binomial (generic and specific) terms have been instituted on such slight differences, to the inconvenient swelling of lists and disturbance of nomenclature.

It is certainly often difficult to determine if it be advisable to give or to retain binomial appellations for certain specimens of Foraminifera. For, on the one hand, there may be an apparent distinctness of form; and, on the other, many gradations may be recognizable between what appear at first sight to be well-marked varieties or even seemingly distinct species. Thus it is often necessary to refer only to the name of the best-known or the typical species or notable variety, the type being usually founded on that member of the group which shows a good medium development. Where this plan is followed on a good zoological basis, to avoid multiplication of names, an examination of a local group of Foraminifera leads more satisfactorily to a recognition of its peculiar facies and special value, than a list of names, which point to differences rather than to consanguinity, with slight modifications of a few types.

For the above reasons, it has been thought advisable to group the Fossil Foraminifera in this Catalogue according to their local occurrence and geological age—the latter indicating the succession of forms, with or without modifications, from one age of the world to another, and the former supplying at one view what has been collected from the different fossil *faunæ* at places easily recognized.

At the same time, to enable the student to form some idea of the range of the several Foraminiferal groups *in time*, the following Table, somewhat modified from one published in the 'Proceedings of the Geologists' Association,' vol. ii. (1872), p. 181, gives a general view of the occurrence and succession of the most important genera from the Silurian epoch to present times.

No columns are here given for the Geological Systems older than the Silurian, namely the *Cambrian*, *Precambrian*, and *Laurentian*, because only one Foraminifer has as yet been definitely determined among their fossils, namely *Eozoön*, in the Lower-Laurentian marble of Canada, although other probable Rhizopodal forms have been observed.

Table of the Range-in-Time of Foraminifera.

		Primary.				Secondary.									Tertiary.			Recent.
		Silurian.	Devonian.	Carboniferous.	Permian.	Trias.	Rhætic.	Lias.	Lower Oolite.	Upper Oolite.	Neocomian.	Gault.	Upper Greensand.	Chalk.	Lower.	Middle.	Upper.	
Porcellanea.	Squamulina	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*
	Nubecularia	...	...	...	...	...	*	...	*	...	...	...	...	...	...	...	...	*
	Miliola †	...	...	...	...	*	...	*	...	*	...	*	...	*	*	*	*	*
	Cornuspira	...	...	*	...	?	...	...	?	...	...	...	...	...	*	*	*	*
	Hauerina	...	...	...	...	...	...	...	...	...	...	*	...	...	...	*	...	
	Vertebralina	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	...	*
	Fabularia	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	...	*
	Peneroplis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	...	*
	Orbiculina	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	...	*
	Orbitolites	...	...	...	...	...	...	*	...	...	...	...	...	*	*	...	...	*
	Alveolina	...	...	...	...	...	...	...	...	...	...	...	...	?	*	*	...	*
	Ovulites	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*		
	Dactylopora	...	...	...	...	*	...	...	...	...	...	...	...	...	*	*	...	*
Arenacea.	Saccammina	...	?	*	...	...	...	?	...	...	...	...	...	...	...	...	...	*
	Polyphragma	...	...	...	...	...	...	...	...	...	...	...	...	*				
	Lituola	...	...	*	...	...	*	*	*	...	*	*	...	*	*	*	*	*
	Trochammina	...	...	*	*	*	...	*	*	*	...	*	...	*	*	*	*	*
	Webbina	...	...	...	...	...	*	*	*	...	*	...	...	...	...	...	*	*
	Nodosinella	...	...	*	*													
	Involutina	...	...	...	...	...	...	*	*									
	Endothyra	...	...	*	...	...	...	*										
	Stacheia	...	...	*														
	Parkeria	...	...	...	...	...	...	...	...	...	...	...	*					
	Loftusia	...	...	...	...	...	...	...	...	...	...	...	...	...	*			
Hyalina.	Textularia	?	...	*	*	*	*	*	?	*	*	*	?	*	*	*	*	*
	Spiroplecta	...	...	*	...	...	...	...	...	...	...	...	...	*	..	...	...	*
	Cuneolina	...	...	...	...	...	...	...	...	...	...	...	...	*				
	Verneuilina	...	...	...	...	...	...	...	...	*	...	...	...	*	*	*	?	*
	Gaudryina	...	...	...	...	...	...	...	...	...	...	...	...	*				
	Chrysalidina	...	...	...	...	...	...	...	...	...	...	...	...	*	...	...	...	*
	Valvulina	...	...	*	...	...	...	...	...	...	...	...	...	*	*	*	...	*
	Bulimina	...	...	...	...	...	*	...	...	*	...	*	*	*	*	*	*	*
	Cassidulina	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*
	Chilostomella	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	...	*
	Allomorphina	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*	...	*
	Ellipsoidina	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
	Lagena	*	...	*	...	...	...	?	*	*	...	*	...	*	*	*	*	*
	Ramulina	...	...	...	...	...	...	...	...	...	...	...	...	*	...	...	...	*
	Nodosaria	?	...	...	*	*	*	*	*	*	*	*	?	*	*	*	*	*
	Dentalina	*	...	...	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Lingulina	...	...	...	...	*	*	*	...	...	...	*	...	*	*	*	*	*
	Frondicularia	...	...	...	...	...	*	*	...	*	...	*	...	*	*	*	*	*
	Vaginulina	...	...	...	...	...	*	*	*	*	*	*	...	*	*	*	*	*
	Marginulina	...	...	...	...	*	...	*	*	*	*	*	...	*	*	*	*	*
	Cristellaria	...	...	...	...	*	*	*	*	*	*	*	*	*	*	*	*	*

† Including *Uni-*, *Bi-*, *Tri-*, *Quinque-*, *Spiro-*, and *Cruciloculina*.

Table (*continued*).

		Primary.				Secondary.								Tertiary.			
		Silurian.	Devonian.	Carboniferous.	Permian.	Trias.	Rhætic.	Lias.	Lower Oolite.	Upper Oolite.	Neocomian.	Gault.	Upper Greensand.	Chalk.	Lower.	Middle.	Upper.	Recent.
Hyalina (*continued*).	Planularia	...	...	...	...	*	*	*	?	*	*	...	...	*	*	*	*	*
	Flabellina	...	...	...	...	...	*	*	?	...	...	...	...	*	*	*		
	Polymorphina	...	...	...	...	*	*	*	...	*	...	*	*	*	*	*	*	*
	Uvigerina	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	?	*
	Orbulina	...	...	...	...	...	...	*	...	*	...	...	...	*	...	*	*	*
	Globigerina	...	...	...	...	*	...	...	...	...	...	*	...	*	*	*	*	*
	Pullenia	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*	?	*
	Sphæroidina	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*	?	*
	Spirillina	...	...	...	...	...	...	...	...	*	...	...	...	...	*	*	*	*
	Patellina	...	...	...	...	...	...	...	...	...	...	...	*	*	*	...	...	*
	Discorbina	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*	*	*
	Planorbulina	...	...	*	...	...	...	*	*	*	...	*	*	*	*	*	*	*
	Carpenteria	...	...	...	...	...	...	...	...	?	...	...	?	?	...	...	...	*
	Tinoporus (Gypsina)	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*	*
	Cymbalopora	...	...	...	...	...	...	...	...	...	...	...	...	*	...	*	...	*
	Pulvinulina	...	...	*	...	...	*	*	*	*	...	*	...	*	*	*	*	*
	Rotalia	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*	*	*
	Calcarina	...	...	*	...	...	...	...	...	...	...	...	...	*	*	*	*	*
	Nonionina	...	...	...	...	...	...	...	...	?	...	...	...	*	*	*	*	*
	Polystomella	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*	*	*
	Archædiscus	...	...	*														
	Amphistegina	...	...	*	...	...	...	...	...	...	...	...	...	...	*	*	*	*
	Fusulina	...	...	*	*													
	Orbitoides	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*		
	Cycloclypeus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	...	*
	Heterostegina	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	...	*
	Operculina	...	...	...	...	...	...	...	...	...	*	...	...	*	*	*	*	*
	Nummulites	...	..	*	...	...	...	...	*	?	...	...	...	?	*	*	*	*
Groups not placed in order.	Syringosphæria	...	...	...	...	*												
	Stoliczkaria	...	...	...	...	*												
	Receptaculites	*	*															
	Ischadites	*																
	Sphæronites	...	*															
	Sphærospongia	*																

In view, then, of aiding at the same time in a special and a comprehensive study of the Fossil Foraminifera and such allied Rhizopods as are preserved in the British Museum, a combined geologico-geographical arrangement has been adopted, of which the following Table of reference is an exposition :—

It will be seen that in the foregoing arrangement certain geographical lines are followed, beginning with the British Islands and going eastward, under the several Geological headings, as far as they are conveniently continuous, and then returning to the West (as at page 50) for a new line.

The successive Formations or Stages of each Geological System are noted in upward order, under the different divisions.

It is not convenient, nor indeed requisite, to give detailed descriptions of the Foraminifera in this Catalogue. There are, however, some genera, and some local groups, of particular interest to Geologist and Zoologist; and for these we have appended special notes, namely:—

The Bibliography of the FORAMINIFERA is very extensive for both the Recent and the Fossil species. In Prof. W. C. Williamson's work 'On the Recent Foraminifera of Great Britain,' published by the Ray Society (4to, London, 1858), and in Dr. W. B. Carpenter's 'Introduction to the Study of the Foraminifera,' published by the Ray Society (4to, London, 1862), there are extensive lists of books and papers on these Rhizopods. Since the date of Dr. Carpenter's work very many excellent Memoirs on recent and fossil forms have been written by L. G. Bornemann, H. B. Brady, Ernest Vanden Broeck, W. B. Carpenter, H. J. Carter, J. W. Dawson, C. W. Gümbel, Max von Hantken, Philippe de la Harpe, T. Rupert Jones, F. W. O. Rymer Jones, Felix Karrer, A. M. Norman, S. R. I. Owen, W. K. Parker, A. E. von Reuss, M. Sars, C. Schwager, G. Seguenza, J. D. Siddall, G. Stache, G. Steinmann, O. Terquem, G. C. Wallich, Joseph Wright, and others.

Very many of the works of these and of earlier writers are referred to in the Catalogue; and we may add that the titles and places of most, if not all, of the others may be found in the 'Catalogue of Scientific Papers,' &c., published by the Royal Society.

The writers on the Foraminifera of the Carboniferous and Permian Formations are especially enumerated by H. B. Brady in his Monograph on those Foraminifera (Palæontographical Society), 4to, 1876.

T. RUPERT JONES.

Erratum: page 22, *for* HAMPSHIRE: BRACKLESHAM *read* SUSSEX: BRACKLESHAM.

GEOGRAPHICAL INDEX

TO THE

CATALOGUE OF THE FOSSIL FORAMINIFERA.

N.B. The names in *italics* are the places whence the *Recent* Foraminifera mentioned in the Catalogue have been obtained.

CATALOGUE

OF

FOSSIL FORAMINIFERA.

PALÆOZOIC OR PRIMARY GROUP.

LAURENTIAN SYSTEM.

NORTH AMERICA.

Lower Laurentian.

48125 & 48126. **Eozoön canadense**, *Dawson*, 1865. Canada. From Sir W. E. Logan, F.R.S.

54955. „ „ „ Canada. From P. Clarke, Esq.

55166. „ „ „ Petit-Nation Seigniory, Canada. From Dr. G. J. Hinde, F.G.S.

P 35. „ „ „ Canada. J. Tennant Coll.

See papers on *Eozoön* in the Quart. Journ. Geol. Soc. vol. xxi. p. 45 &c. (Other references are given in the sequel.)

BOHEMIA.

Laurentian.

47231. "**Eozoön bavaricum**" (?), *Guembel*. In ophiocalcite from Raspenau, near Friedland, in Northern Bohemia. Fritsch Coll.

See C. W. Guembel's memoir "Ueber das Vorkommen von Eozoön im ostbayerischen Urgebirge," Sitzungsber. Akad. Wiss. München, 1866. Also translated in 'The Canadian Naturalist and Geologist,' new ser. vol. viii. 1868, p. 81, pl. 1, and edited, with notes, by T. S. H.

See also F. v. Hochstetter, "Ueber das Vorkommen von Eozoön im krystallinischen Kalke von Krummau im südlichen Böhmen," Sitzungsber. Akad. Wiss. Wien, vol. liii. 1866. This memoir is noticed in the Quart. Journ. Geol. Soc. vol. xxii. Miscell. part, p. 16.

SILURIAN SYSTEM. (Including "Cambrian" of some authors.)

BRITISH ISLES.

Lower Silurian. (Wales and Scotland.)

Rhizopoda of uncertain alliance.

38665	**Sphærospongia hospitalis**, *Salter.*	Caradoc Sandstone. Haverfordwest, Wales.	Presented by A. Marston.
40314.	„ „ „	Caradoc Sandstone. Haverfordwest.	A. Marston.
38664.	„ **(Nidulites).**	Haverfordwest.	Presented by H. Owen, Esq.
P 1148.	„ „	Haverfordwest.	Daniels Coll.
P 1147.	„ ("**Nidulites favus**, *Salter*," Q. J. Geol. Soc. vii. 174.)	Caradoc beds. "1, Thrave;" "2, Mulloch;" Ayrshire.	Murchison Coll.
P 1145.	„ **Ischadites.**	Caradoc beds.	North Wales.

Upper Silurian. (England.)

Rhizopoda of uncertain alliance.

54949.	**Ischadites Kœnigi**, *Murchison.*	Dudley.	John Gray Coll.
P 1154.	„ „ „	„	
54871.	„ „ „	Malvern.	John Gray Coll.
P 1152.	„ „ „	Wenlock Limestone.	Dudley.
P 1151.	„ „ „	„	„
P 1150.	„ „ „	Wenlock Limestone. Malvern Tunnel.	John Gray Coll.
P 1149.	„ „ „	Lower-Ludlow beds.	Ledbury.
38667.	„ „ „	Wenlock Limestone.	Walsall.
54872.	„ „ „	Dudley.	John Gray Coll.
54948.	„ „ „	Malvern.	„

GOTHLAND.

Upper Silurian.

Rhizopod of uncertain alliance.

48314. **Receptaculites.** (Fragments.) Isle of Gothland, Baltic.

RUSSIA (Esthonia).

Lower Silurian.

Rhizopod of uncertain alliance.

P 834. **Receptaculites orbis**, *Eichwald.* "Baltispor" (? Port Baltic, near Reval, Esthonia). Murchison Coll.

BOHEMIA.

Silurian.

Rhizopoda of uncertain alliance.

54870. **Ischadites Kœnigi,** *Murchison.* (Twelve specimens; small and round; with "engine-turned" markings; often distorted by pressure.) Bubowitz, Bohemia. Barrande Coll.

50221. **I. Kœnigi,** *Murch.* Bohemia.

P 1141. **Sphæronites.** Cornucopial in shape. Bubowitz, Bohemia. Barrande Coll.

NORTH AMERICA.

Silurian.

Rhizopoda of uncertain alliance.

P 831.
P 840.
P 839. } **Receptaculites occidentalis,** *Salter.* Lower Silurian. Cape Louis-Napoleon (79° 38′ N.). Feilden-Nares Coll.

See Etheridge's memoir "On the Arctic Fossils collected by the Expedition of 1875–76," Quart. Journ. Geol. Soc. 1878, vol. xxxiv. p. 577.

P 833.
P 838.
60561. } **R. arctica,** *Etheridge.* Lower Silurian. Cape Louis-Napoleon (79° 38′ N.). Feilden-Nares Coll.

See Etheridge's memoir, *op. cit.* p. 576.

P 836. **Reptaculites.** (Fragments.) Lower Silurian. Feilden-Nares Coll.

40346. **R. Neptuni?** (*Defrance*). Lower? Silurian. Igloolik, Arctic America. Presented by Capt. Lyon, R.N., and J. J. Bennett, Esq.

36110. **R. Neptuni?** (*Defrance*). Lower? Silurian. Igloolik, Arctic America. Presented by Capt. Lyon, R.N.

40345. **R. Neptuni?** (*Defrance*). Lower? Silurian. North America. Presented by J. J. Bennett, Esq.

P 1143. „ „ Silurian? North America.

P 832. „ „ Lower Silurian. Canada. From the Museum of Practical Geology.

P 835. **R. occidentalis,** *Salter.* Lower Silurian. Red-River Settlement, Lake Wenibeg. Hector Coll.

For Mr. Salter's description of this species, see the Geol. Surv. Canada, vol. x. Decade 1, p. 45, pl. 10. f. 1–7.

90226. **R. Owenii,** *Hall.* Lower Silurian. Trenton Limestone, Dubuque, Indiana.

P 48. **R. occidentalis,** *Salter.* Lower Silurian. Hudson-River Group, East Tennessee. From the Mus. Pract. Geol.

NORTHERN INDIA.

Lower Silurian.

Rhizopoda of uncertain alliance.

P 841. **Sphærospongia inosculans,** *Salter.* Northern Himalaya.
. Strachey Coll. From the Mus. Pract. Geol.

P 1144. **S. melliflua,** *Salter.* Northern Himalaya.
Strachey Coll. From the Mus. Pract. Geol.

Mr. Salter gave a full account of these fossils in the 'Palæontology of Niti in the Northern Himalaya: being Descriptions and Figures of the Palæozoic and Secondary Fossils collected by Colonel Richard Strachey, R.E.' Descriptions by J. W. Salter, F.G.S., A.L.S., and H. F. Blanford, A.R.S.M., F.G.S. Published at Calcutta, and reprinted, with slight corrections, for private circulation from Colonel R. Strachey's forthcoming work on the "Physical Geography of the Northern Himalaya" (8vo, Calcutta, 1865). See p. 48, *Sphærospongia* ("new genus"), Salter, and *S. melliflua*, Salter, pl. 5. f. 4–6; p. 49, *S. inosculans*, Salter pl. 5. f. 7–9, "probably allied to *Ischadites.*" *Nidulites* is also here referred to an alliance with *Sphærospongia.*

For the characters and range of the Palæozoic rocks near the Niti Pass, see the memoir "On the Geology of Part of the Himalaya Mountains and Tibet," by Captain Richard Strachey, R.E., F.G.S. [now Lieut.-General R. Strachey, R.E., C.S.I., F.R.S., &c.], Quart. Journ. Geol. Soc. vol. vii. pp. 292 &c.

DEVONIAN SYSTEM.

ENGLAND.

Rhizopoda of uncertain alliance.

23309. **Sphæronites tessellatus,** *Phillips.* Newton-Bushel, Devon.

P 1146. „ „ „ Newton-Bushel, Devon.
Bowerbank Coll.

BELGIUM.

Rhizopoda of uncertain alliance.

P 837. **Receptaculites Neptuni** (*Defrance*). Couvin, Belgium.
From the Museum of Practical Geology.

P 1142. „ „ (*Defrance*). Chimay, Belgium.
De Koninck Coll.

49124. „ „ „ Chimay, Belgium. (Original specimen, 'Lethæa Geogn.' 1854, vol. i. part 2, p. 157, pl. v[1]. fig. 5*a*.) (Krantz.)

CARBONIFEROUS SYSTEM.

BRITAIN.

(Scotland and England.)

SCOTLAND.

P 13. **Archædiscus Karreri,** *Brady.* Lower Carboniferous Limestone. Brockley, Lesmahago.

P 5. **Valvulina palæotrochus** (*Ehrenberg*). Lower Carb. Limestone. Brockley.

P 7. **V. palæotrochus** (*Ehrenb.*), var. **compressa**, *Brady*. L. C. L. Same locality.

P 10. **V. Youngi**, *Brady*. L. C. L. South Shields, East Kilbride.

P 14. **V. decurrens**, *Brady*. L. C. L. Same locality.

P 15. **V. plicata**, *Brady*. L. C. L. Capelrig, East Kilbride.

P 6. **Climacammina antiqua**, *Brady*. L. C. L. Brockley.

P 9. **Stacheia acervalis**, *Brady*. L. C. L. Hairmyres, near East Kilbride.

P 3. **Lituola Bennieana**, *Brady*. L. C. L. Mount Lothian quarry, Penicuick.

P 4. **Endothyra Bowmani**, *Philips*. L. C. L. Boghead, Hamilton.

P 12. **E. radiata**, *Brady*. L. C. L. South Shields.

P 11. **Trochammina centrifuga**, *Brady*. Upper Carboniferous Limestone. Robroyston, near Glasgow.

P 8. **Saccammina Carteri**, *Brady*. L. C. L. Dunbar. John Young Coll.

55192. „ „ „ Carbonif. L. Baad's Hill, Linlithgowshire.

P 1132. „ „ „ Second Calmy Limestone. Braidwood, Carluke. In weathered rock, and in polished and mounted slices. John Young Coll.

The foregoing Carboniferous species (with others) are described and figured by H. B. Brady, F.R.S., in his "Monograph of Carboniferous and Permian Foraminifera," Pal. Soc. London, 1876.

ENGLAND.

27508 & P 594. Oolitic limestone from the Carboniferous or Mountain Limestone of Clifton, near Bristol, with Foraminifera and other small organisms (obscure) in the centre of the granules, as seen by means of the microscope on the cut and polished surface. Prof. W. C. Williamson referred in 1847 to the existence of Foraminifera in the oolitic limestone of Clifton (Mem. Manchester Lit. & Phil. Soc. vol. viii.).

P 1128. Granular ferruginous material from a bed of the Lower Carboniferous Limestone at Clifton, near Bristol, known as the "Microzoal Bed," and containing rolled fragments of Polyzoa, Encrinites, &c., and obscure Foraminifera.

See Mr. Stoddart's paper in the Ann. & Mag. Nat. Hist. 1861, ser. 3, vol. viii. p. 489 &c.

RUSSIA.

40108. **Fusulina cylindrica**, *Fischer**. White *Fusulina*-limestone. Marked by Sir R. I. Murchison "*L. Volga.*" Murchison Coll.

40108. **F. cylindrica**. *Fusulina*-limestone. „

* Oryctograph. Moscou, 1830, p. 126, pl. 13. f. 1-11.

40108. **F. cylindrica.** *Fusulina*-limestone. Marked by Sir R. I. Murchison "Mouth of Ussa. Carb. Limestone." Murchison Coll.

P 650. **F. cylindrica.** White *Fusulina*-limestone. Miatschkovo (Mätschkowo), near Moscow.

AMERICA.

Arctic America.

P 651. **Fusulina hyberborea,** *Salter.* Depôt Point (Arctic Regions). Presented by Sir E. Belcher to the Mus. Pract. Geol.

Waterworn piece of light brownish *Fusulina*-limestone, partly polished. Collected by the expedition under Sir E. Belcher, 1852–54. Described by J. W. Salter in Belcher's 'Last of the Arctic Voyages,' 1855, vol. ii. p. 380, pl. 36. figs. 1–3.

United States, North America, Indiana.

P 1130. Grey oolitic limestone containing **Endothyra Bowmani,** *Phillips* (*Rotalia Baileyi*, Hall), obscure; together with small Gasteropods, Encrinites, Bivalves, &c.

"Subcarboniferous;" "Warsaw Limestone," James Hall; "St. Louis Limestone," Owen.

AUSTRALASIA.

Sumatra.

P 258. **Fusulina princeps** (*Ehrenb.*). "Sumatra, 1 *a*," and "Sumatra, I 1." Presented by M. R. D. M. Verbeek.

See Mr. H. B. Brady's description and figure in the Geol. Mag. (1875) dec. ii. vol. ii. p. 537, pl. 13. fig. 6.

Tasmania.

P 1129. Dark grey Carboniferous Limestone, full of a contorted porcellanous Foraminifer (new species of *Cornuspira*).

PERMIAN SYSTEM.

ENGLAND.

P 1131. **Trochammina Roessleri** (*Schmid*), **incerta** (*d'Orb.*). Lower Magnesian Limestone. Langton, Durham.

Ann. & Mag. Nat. Hist. ser. 4, vol. iv. p. 389, pl. 13. fig. 1. Figured specimen.

P 593. **T. pusilla** (*Schlotheim*). Sunderland.

P 592. **T. milioloides,** J., P. & K. Ann. & Mag. N. H. Dec. 1869, p. 390, pl. 13. f. 10. Sunderland.

40038. { **Nodosaria radicula** (*Linné*). **Dentalina communis,** *d'Orb.* } On the weathered surface of Permian Limestone, from Byer's Quarry, Sunderland. From T. Rupert Jones, Esq.

See T. Rupert Jones's descriptions in W. King's "Monograph of the Permian Fossils," Pal. Soc. London, 1850, p. 15 &c. and p. 57; also see pl. 3 and pl. 10 in Brady's "Monogr. Carb. and Permian Foraminifera," Pal. Soc. 1876.

GERMANY.

55058. **Trochammina pusilla** (*Geinitz* *). Lower Zechstein. Trebnitz.
55059. „ „ „ Zaufensgraben.
73294. { „ „ „ Lutzschethal.
„ „ „ Moderwitz, near Neustadt.
73307. **Dentalina communis**, *d'Orb.* (**permiana**, *Jones*). Trebnitz, near Gera. Lower Zechstein.
55060. **Nodosaria Kingii**, *Reuss.* Trebnitz. Lower Zechstein.
55061. **N. radicula** (*Linn.*) (**Kirkbyi**, *Richter*, in Geinitz's 'Dyas,' p. 121, pl. 20. f. 30). Trebnitz. Lower Zechstein.
55062. **N. radicula** (*Linn.*) (**Jonesi**, *Richter*, in Geinitz's 'Dyas,' *ib.* f. 31). Trebnitz. Lower Zechstein.
55063. **N. Geinitzi**, *Reuss*†. Lower Zechstein. Zaufensgraben.
55064. „ „ „ Trebnitz.
55066. **Textularia multilocularis**, *Reuss*, in Geinitz's 'Dyas,' p. 122, pl. 20. f. 38. Lower Zechstein.
55065. **T. Jonesi**, *Brady* (**cuneiformis**, *Jones*). Zschippern und Zaufensgraben. Lower Zechstein.

MESOZOIC OR SECONDARY GROUP.

TRIASSIC SYSTEM.

GERMANY.

P 77. "**Nummulites Althausi**, *Alberti*, Muschelkalk (Wellendolomit), Horgen," are small round or oval sandy concretions, or rolled balls of sandy clay.

JURASSIC SYSTEM.

Lias Series. (England.)

Lower Lias. (Gloucestershire.)

32718. **Trochammina infima** (*Strickland*). Wainlode Cliff, Gloucestershire. Presented by the Rev. P. B. Brodie, F.G.S.

Numerous, very minute, discospiral, and white, in the light-brown rock, "yellowish slaty stone" (*Strickland*).

Quart. Journ. Geol. Soc. vol. ii. p. 30 ("*Orbis infimus*"). Ann. & Mag. Nat. Hist. ser. 4, vol. iv. p. 388 (*Trochammina infima*).

32717 & 34356. **Involutina liassica** (*Jones*). Fretherne Cliff, Gloucestershire. Presented by the Rev. P. B. Brodie, F.G.S.

* See Geinitz, 1848, Verstein. Zechst. u. Rothlieg. p. 6, pl. 3. f. 3–6; Jones, in King's 'Monogr. Perm. Foss.' 1850, p. 57; Jones, Parker, and Kirkby, Ann. & Mag. Nat. Hist. ser. 4, vol. iv. 1869, p. 389 &c. pl. 13; Brady, "Mon. Carb. & Perm. Foram." Pal. Soc. 1876, p. 78, pl. 3. f. 4, 5.

† Jahresber. Wetterauer Gesell. 1851, p. 73 &c.

Numerous, small, and lenticular, on the weathered surface of the impure bluish limestone.

Brodie and Jones, Ann. & Mag. Nat. Hist. ser. 2, vol. xii. (1853) pp. 272, 275; Terquem, Mém. Acad. Imp. Metz, 1862, p. 426, &c.; Geol. Mag. vol. i. 1864; H. B. Brady, "On *Involutina liassica* (Jones)," p. 193 &c., pl. 9. See also L. G. Bornemann, "Ueber die Foraminiferengattung *Involutina*," Zeitsch. deutsch. geol. Gesell. Jahrgang 1874, p. 702 &c. pls. 18 & 19.

Middle Lias. (Banbury*.)

P 84. **Trochammina incerta** (*d'O.*).
,, **Nodosaria raphanus** (*Lin.*), varieties.
,, **N. nitida**, *Blake.*
,, **Dentalina pauperata**, *d'O.*
,, **D. lineolata?**, *Rss.*
,, **Frondicularia angulosa**, *d'O.*, var.
,, **Marginulina glabra**, *d'O.*

Middle Lias (*Capricornus*-zone). (Banbury.)

P 84. **Trochammina incerta** (*d'O.*).
,, **Nodosaria raphanus** (*Lin.*), varieties.
,, **Dentalina obliquestriata**, *Rss.*
,, **Frondicularia striatula**, *Rss.*
,, **Marginulina glabra**, *d'O.*

Upper Lias. (Banbury.)

P 84. **Trochammina incerta** (*d'O.*).
,, **Nodosaria raphanus** (*Lin.*), varieties.
,, **Dentalina pauperata**, *d'O.*
,, **Marginulina glabra**, *d'O.*
,, **M. lævigata?**, *d'O.*
,, **M. picta**, *Blake.*
,, **Cristellaria rotulata**, *Lam.*
,, **C. crepidula** (*F. & M.*).
,, **Polymorphina**, sp. T. R. Jones Coll.

* See 'Sketch of the Geology of the Neighbourhood of Banbury,' by Mr. Thomas Beesley, F.C.S. Reprinted from the 'Banbury Guardian.' Small 8vo. Banbury, 1872. For memoirs on Liassic Foraminifera, see:—

J. G. Bornemann, 'Lias-Formation von Göttingen,' 1854.

O. Terquem, "Recherches sur les Foraminifères du Lias" (six memoirs), Mém. Acad. Imp. Metz, 1860–68.

H. B. Brady, "Synopsis of the Foraminifera of the Middle and Upper Lias of Somersetshire," Proc. Somerset Archæol. & Nat. Hist. Soc. vol. xiii. 1867, p. 104 &c.

Joseph Wright and H. B. Brady, "A List of Irish Liassic Foraminifera," Proc. Belfast Nat. Hist. Soc. 1871, pp. 25, 28.

J. F. Blake, in 'The Yorkshire Lias,' by R. Tate and J. F. Blake, 8vo, 1876, pp. 449 &c.

NEOCOMIAN SYSTEM. (England.)

Speeton Clay. (Yorkshire.)

P 622. **Pulvinulina caracolla** (*Roemer*), &c. T. Rupert Jones Coll.

CRETACEOUS SYSTEM. (British Isles.)

ENGLAND.

Gault*. (Folkestone, Kent.)

P 620. **Lingulina carinata**, *D'Orb.*
P 618. **Frondicularia** (fragment).
P 617. **F. hastata**, *Reuss*, var.
P 621. **Vaginulina costulata**, *Rss.*
„ **Frondicularia hastata**, *Rss.*
„ **Cristellaria cultrata** (*Montf.*).
„ **Bulimina obtusa**, *d'O.*
„ **Pulvinulina caracolla** (*Roemer*), &c.
} T. Rupert Jones Coll.

P 619. Piece of Gault from Folkestone, Kent, with **Pulvinulina caracolla** (*Roemer*), Shells, &c. T. Rupert Jones Coll.

Greensand (Upper Greensand); Cenomanian Series.

40030. 40031. **Parkeria† sphærica**, *Carpenter & Carter.* Cambridge.
55083. **Parkeria sphærica.** Cambridge. Presented by J. F. Walker, Esq.
P 25. „ „ Cambridge.
56564. „ „ Cambridge.
P 1026. „ „ (A cut specimen and a polished slice on glass.) Cambridge. From Dr. Carpenter.
P 1027. „ „ ? Several large and small specimens. Cambridge?
P 1021. „ „ ? Rolled specimen. Tracey Coll.
P 1023. **Parkeria.** Isle of Wight.
P 1024 & P 1025. **Parkeria.** (Polished slices on glass and a cut specimen.) Ventnor, Isle of Wight. (Mark Norman.)

* A list of the known species and notable varieties of Foraminifera from the Gault of England is given by Mr. W. Topley, F.G.S., in the 'Memoirs of the Geological Survey of England and Wales: Geology of the Weald,' 1875, pp. 433, 434.

† W. B. Carpenter, Phil. Trans. 1869, p. 721 &c. pls. 73–76; H. J. Carter, Ann. & Mag. Nat. Hist. 1877, ser. 4, vol. xix. p. 61 &c. (On the relationship of *Hydractinia*, *Parkeria*, and *Stromatopora* as Hydrozoa.)

P 1022. **Parkeria sphærica?** Warminster.

P 687, P 860, P 861, & P 862. **Patellina (Orbitolina) lenticularis** (*Blumenbach*). Milber Down, Devon. T. R. Jones Coll.

P 680. **P. (Orbitolina) lenticularis** (*Blumenbach*). From Greensand-flint gravel-bed (=Drift), Newton-Abbot, Devon. Presented by Mr. Vicary.

P 679. **P.? (Orbitolina) lenticularis?** In a flint from Dorset or Devon?

Chalk-marl (Turonian Series) and Lower Chalk.

P 635. **Placopsilina cenomana,** *d'Orb.*
P 629. **Textularia trochus,** *d'O.*
T. turris, *d'O.*
P 632. **Verneuilina triquetra,** *Münster.*
P 637. **Bulimina obtusa,** *d'O.*
P 630. **Vaginulina costulata,** *Reuss.*
P 633. **Frondicularia inversa,** *Rss.*
F. mucronata, *Rss.*
P 628. **Flabellina cordata,** *Rss.*
P 636. **Cristellaria triangularis,** *d'O.*
P 631 & P 634. **C. rotulata,** *Lam.*
P 638. **Planorbulina ammonoides,** *Rss.*

} From the Chalk-marl at Dover, in which some large fish-vertebræ and small fish-teeth were present. Collected by John Purdue.

P 611. **Lituola irregularis,** *Rss.*
P 612. **Textularia trochus,** *d'O.*
P 601. **T. prælonga,** *Rss.*, &c.
P 610. **Bulimina obtusa,** *d'O.*
P 602 & P 605. **Cristellaria rotulata,** *Lam.*
P 606. **Vaginulina costulata,** *Rss.*
P 613. **Dentalina communis,** *d'O.*
P 607. **Frondicularia Cordai,** *Rss.*
34892, P 603, & P 608. **Flabellina ovata,** *Rss.*
P 603. **F. cordata,** *Rss.*
P 609. **Frondicularia inversa,** *Rss.*
P 604. **Polymorphia horrida,** *Rss.*

} Chalk-marl. Charing, Kent. W. Harris Coll.

P 627. Foraminifera and Entomostraca from the Chalk-marl of Charing, Kent; mounted in a small oval frame by W. Harris, F.G.S. Presented by T. Rupert Jones.

Chalk. Senonian Series.

P 152. Washed Chalk, consisting of Foraminifera, prisms of *Inoceramus*-shell, &c., from the Chalk of Wilts (Tidworth), prepared by Dr. Southby. J. Brown Coll.

54971. **Nodosaria Zippei**, *Rss.* On flint from the Upper Chalk of Bromley, Kent.

4832. **Lituola nautiloidea** (*Lamarck*). A section in flint. Kemptown, Brighton. Mantell Coll.

Labelled "*Spirolinites Northamptonis*, discovered by the Marquess of Northampton, Brighton, 1833."

P 116, P 117, P 118, P 119, & P 120. Seven specimens of broken flint from Sussex (Stoke and Chichester), showing sections of **Lituola nautiloidea** and **L. irregularis**. Collected by the Marquess of Northampton. Formerly these were named "*Spirolinites Stokesii, Lyelli, Mantelli*," &c.

See Mantell's 'Wonders of Geology,' 1st and 3rd editions, 1838–39; Proc. Geol. Soc. vol. iii. p. 685; and Dixon's 'Geology of Sussex,' 2nd edit. p. 286.

The woodcuts in the 'Wonders of Geology' are:—*Spirolinites Murchisoni*, 'Wonders of Geol.' 1839, 3rd edit., p. 322 (this is also given as one of the figs. of *Sp. Comptoni* in 1838); *S. Stokesii*, ibid. 1838, 1st edit. p. 298; *S. Lyellii*, ibid. pp. 297, 298; *S. Mantelli*, ibid. p. 298; *S. Comptoni*, ibid. pp. 297, 298; *S. Bucklandi* (this is probably the same as one of the figs. of *Sp. Lyellii*, 1838).

P 96. **Lituola nautiloidea** (*Lam.*) and **L. irregularis**, *Rss.* Margate. Wetherell Coll.

P 97. **Cristellaria rotulata**, *Lam.*, and **Flabellina cordata**, *Rss.* Margate. Wetherell Coll.

P 147. **Lituola**, section of, in flint. Whetstone. „

P 98. **Textularia prælonga ?**, *Rss.*
Nodosaria Zippei, *Rss.*
Marginulina ensis, *Rss.* } Figured specimens. } From the Chalk in a deep well at Colchester*. J. Brown Coll.

P 99. **Cristellaria rotulata**, *Lam.*

P 95. **Lituola nautiloidea**, *Lam.*
„ **Nodosaria Zippei**, *Rss.*
„ **Frondicularia Archiaciana**, *d'O.*
„ **Marginulina ensis**, *Rss.*
P 92. **Cristellaria rotulata**, *Lam.*
P 95. **Bulimina obtusa**, *d'O.*
P 89. **Cristellaria rotulata**, *Lam.*
P 94. **Bulimina variabilis**, *d'O.*
P 91. **Planorbulina ammonoides**, *Rss.*
P 90. **Globigerina bulloides**, *d'O.*
} From the Chalk in a well at Colchester, at depths of 240 and 300 feet. T. R. Jones Coll.

* See the note by J. Brown and T. R. Jones on some Foraminifera and Polyzoa from the Chalk at Colchester, "Note on the Artesian Well at Colchester, and Remarks on some of the Microscopic Fossils from the Colchester Chalk," Ann. & Mag. Nat. Hist. ser. 2, vol. xii. (1853), p. 240, pls. 8 & 9, in which are figured:—

Pl. 9. f. 1. Nodosaria limbata, *d'O.*
„ f. 2. Marginulina ensis, *Rss.*
„ f. 3. —— elongata, *d'O.*
„ f. 4. —— trilobata, *d'O.*
„ f. 5. Frondicularia Verneuiliana, *d'O.*
Pl. 9. f. 6. Cristellaria rotulata, *Lam.*
„ f. 7. Globigerina marginata (*Rss.*).
„ f. 8. —— cretacea, *Rss.*
„ f. 9. Truncatulina Beaumontiana, *d'O.*

P 103 & P 150. **Lituola nautiloidea**, *Lam.*
P 103 & P 150. **L. irregularis**, *Rss.*
P 103. **L. lagenalis**, *Roem.*
P 148. **Textularia foeda**, *Rss.*
„ **T. trochus**, *d'O.*
„ **Bulimina obtusa**, *d'O.*
„ **Dentalina communis**, *d'O.*
P 106. **Nodosaria limbata**, *d'O.*
„ **N. Zippei**, *Rss.*
P 148. **Marginula ensis**, *Rss.*
P 104. **Frondicularia Verneuiliana**, *d'O.*
P 149. **Flabellina cordata**, *Rss.*
P 105 & P 151. **Cristellaria rotulata**, *Lam.*

Foraminifera, "derived from the Chalk," washed out from Bed "No. 5" (sand and gravel), below the freshwater beds at Copford, Essex.
J. Brown Coll.
See Quart. Journ. Geol. Soc. vol. viii. 1852, pp. 185–6.

P 115. **Trochammina cretacea**, *Rss.*
P 108. **Lituola nautiloidea**, *Lam.*
„ **L. irregularis**, *Rss.*
P 113. **Verneuilina triquetra** (*Münst.*).
P 111. **Bulimina obtusa**, *d'O.*
„ **B. variabilis**, *d'O.* &c.
P 109. **Dentalina communis**, *d'O.*
P 110. **Nodosaria Zippei**, *Rss.*
P 112. **Marginulina ensis**, *Rss.*
P 114. **Cristellaria rotulata**, *Lam.*
P 107. **Globigerina bulloides**, *d'O.*

South-east of England, probably. (J. Simmons.)

50499. **Bulimina variabilis**, *d'O.*
50500. **B. obliqua?**, *d'O.*
50501. **B. obtusa**, *d'O.*
50502. **B. brevis**, *d'O.*
50504. **B. Murchisoniana**, *d'O.*
50495. **Planorbulina Clementiana**, *d'O.*
50496. **P. Lorneiana**, *d'O.*
50497. **Pulvinulina Micheliniana** (*d'O.*).
50498. **Rotalia umbilicata**, *d'O.*
50513. **Textularia trochus**, *d'O.*
50511. **Verneuilina triquetra** (*Münst.*).
50509. **Gaudryina pupoides**, *d'O.*
50510. **G. rugosa**, *d'O.*
50512. **Uvigerina tricarinata**, *d'O.*
5058. **Nodosaria Zippei**, *Rss.*
5057. **Marginulina trilobata**, *d'O.*
5055. **Frondicularia Verneuiliana**, *d'O.*
5056. **Flabellina Baudouiana**, *d'O.*
50514. **Cristellaria rotulata**, *Lam.*
50503. **Globigerina cretacea**, *Rss.*

From the Chalk of Kent.
Morris Coll.

P 100. **Nodosaria Zippei**, large. Speen, near Newbury. T. R. Jones Coll.
Figured in T. R. Jones's 'Lecture on the Geological History of Newbury, Berks,' 1854, p. 48, pl. 2. fig. 1.

P 102. **Nodosaria Zippei**, *Rss.* Flint impression. Northfleet. Wetherell Coll.

P 101. **Nodosaria.** Internal cast (very fine), with a cast of a Coral, in flint. Wetherell Coll.

P 1138. A series of **Placopsilinæ** (attached to fossils of the Chalk). Gravesend. Wetherell Coll.

24501. **Gaudryina pupeides**, *d'O.*
24502. **G. rugosa**, *d'O.*
24503. **Verneuilina triquetra** (*Münster*).
24512. **Bulimina variabilis**, *d'O.*
24513. **B. obliqua?**, *d'O.*
24514. **B. obtusa**, *d'O.*
24516. **B. Murchisoniana**, *d'O.*
24504. **Uvigerina tricarinata**, *d'O.*
24520. **Nodosaria Zippei**, *Rss.*
24518. **Frondicularia Archiaciana**, *d'O.*
24519. **Flabellina Baudouiniana**, *d'O.*
24510. **Cristellaria triangularis**, *d'O.*
24511. **C. rotulata**, *Lam.*
24505. **Planorbulina Clementiana** (*d'O.*).
24506. **P. Lorneiana**, *d'O.*
24508. **Pulvinulina Micheliniana** (*d'O.*).
24509. **Rotalia umbilicata**, *d'O.*
24517. **Globigerina cretacea**, *Rss.*

From Gravesend and elsewhere in the south-east of England.
Presented by T. R. Jones, Esq.

Chalk. (Hampshire.)

P 1153. These specimens, marked "Portsdown Chalk (upper beds)," were collected by W. Lonsdale, Esq., in 1835, and were given by Dr. A. G. Mantell, not long before his death, to T. Rupert Jones. T. R. Jones Coll.

Nodosaria Zippei, *Rss.*
Cristellaria rotulata, *Lam.*
Bulimina brevis, *d'O.*
B. variabilis, *d'O.*
Planorbulina Clementiana (*d'O.*).
P. ammonoides, *Rss.*
Globigerina elevata, *d'O.*
G. cretacea, *Rss.*
Entomostraca, Polyzoa, &c.

Some of these Foraminifera (*Nodosaria*, *Cristellaria*, and *Planorbulina*) and Entomostraca (*Cytherella*) were figured in Sir C. Lyell's 'Elements of Geology,' 1838, p. 55, woodcuts.

P 125. {**Lituola nautiloidea**, *Lam.*
L. irregularis, *Rss.*

P 143, P 144, P 145, P 146. {**Textularia fœda?**, *Rss.*
T. turris, *d'O.* &c.
Verneuilina triquetra (*Münst.*).

P 135. **Bulimina obtusa**, *d'O.*

P 135 & P 139. **B. variabilis**, *d'O.*

P 140. **Virgulina?**

P 123. **Ramulina aculeata** (*d'O.*).

P 131. **Glandulina lævigata**, *d'O.*

P 124. **Nodosaria Zippei**, *Rss.* &c.

P 122. **Dentalina communis**, *d'O.*

P 130. **Marginulina ensis**, *Rss.*, and **M. glabra**, *d'O.*

P 134. **Vaginulina costulata**, *Rss.*

P 126 & P 128. **Frondicularia Archiaciana**, *d'O.*

P 127. **F. Verneuiliana**, *d'O.*

P 132. **Cristellaria rotulata**, *Lam.*

P 133. **C. cultrata** (*Montf.*).

P 129. **Flabellina cordata**, *Rss.*

P 142. **Polymorphina?**

P 137. **Planorbulina ammonoides**, *Rss.* &c.

P 136. **Rotalia umbilicata**, *d'O.*

P 138. {**Globigerina cretacea**, *Rss.*
G. marginata, *Rss.*

P 141. **Sphæroidina bulloides** (*d'O.*).

} 54982. Foraminifera from the Chalk of Kent. (J. Simmons.)

54916–54945. A series of pieces of flint, cut and mounted, from the Chalk of S.E. England, showing sections and internal casts of Foraminifera; accompanied by a letter from the Rev. H. Eley, explaining that [most of] these specimens, with others, were used in the illustration of his book entitled 'Geology in the Garden, or the Fossils in the Flint Pebbles,' 8vo, London, 1859. Presented by the Rev. H. Eley.

The specimens are numbered 1 to 59 (no. 36 is missing).

54916. (1) **Nodosaria Zippei**, *Reuss.*
" (2) " " " On the outside of the flint.
} 'Geology in the Garden,' pl. 4. f. 23, p. 198; and pl. 9. f. 23 C, p. 202.

" (3) " **radicula** (*Linn.*), with stolon.

" (4) " **Zippei**, *Rss.* See above.

54917. (5) " **anglica**, *Ehrenberg* (?). Near *D. trichostoma*, Rss., and probably a variety of *N. ovicula*, d'Orb.

54918. (6) **Dentalina communis**, *d'Orb.*
54915. (7) **D. communis**, *d'Orb.* Lined with chalcedony.
54918. (8) **D. communis**, *d'Orb.* Broken longitudinally.
} 'Geology in the Garden,' pl. 4. f. 21, p. 197; and pl. 6. f. 33, p. 199.

„ (9) A young Sponge, with spicula, in section.
54920. (10) **Nodosaria subulata**, *Rss.* Median section.
54919. (11) **Cristellaria rotulata**, *Lam.*
„ (12) „ „ „
} Pl. 2. f. 8, p. 194; and pl. 8 & 7 C, p. 202.
„ (13) „ **ovalis**, *Rss.* (C. producta, *v. Hag.*).
„ (14) „ „ (**triangularis**?).
„ (15) „ „ („).
„ (16) „ „ Broken, showing molluskite.
} Pl. 2. f. 7, p. 194.
54921. (17) **Marginulina ensis**, *Rss.*
54922. (18) **Lituola irregularis**, *Rss.*
54923. (19) **Flabellina rugosa**, *d'Orb.* Pl. 3. f. 18, p. 196; and pl. 9. f. 18 C, p. 202.
„ (20) „ „ „
„ (21) „ **cordata**, *Rss.*
„ (22) „ „ „
54924. (23) **Frondicularia elegans**, *d'Orb.* Pl. 4. f. 20, p. 197; pl. 9. f. 20 C, p. 202.
„ (24) „ **Archiaciana**, *d'Orb.* Pl. 4. f. 19, p. 197.
54925. (25) **Bulimina intermedia**, *Rss.*
„ (26) „ Broken.
} Pl. 5. f. 30, p. 198.
54926. (27) **Textilaria globulosa**, *Ehrenberg*, and **Globigerina cretacea**, *d'Orb.* Pl. 2. f. 9, p. 194; pl. 9. f. 9 C, p. 202.
54927. (28) „ **turris**, *d'Orb.* (*non* obsoleta, *Rss.*). Pl. 2. f. 10, p. 195; pl. 8. f. 10 C, p. 202.
54928. (29) „ **trochus**, *d'Orb.* Pl. 6. f. 34, p. 199.
54929. (30) **Bolivina punctata**, *d'Orb.* Pl. 3. f. 13, p. 195.
54930. (31) „ Broader form? Pl. 3. f. 14, p. 195.
54931. (32) „ **obsoleta**, *Eley.* Pl. 2. f. 11, p. 195; and pl. 8. f. 11 C, p. 202.
54932. (33) „ **biformis**, *Eley.*
54933. (34) **Virgulina paradoxa**, *Ehrenb.* Pl. 2. f. 12, p. 195; and pl. 8. f. 12 C, p. 202.
„ (35) „ Fragment of a larger form.
(36) **Spiroplecta rosula**, *Ehrenb.* A cast from a hollow flint, on glass. Missing. Pl. 3. f. 15, p. 196; and pl. 9. f. 15 C, p. 202.
54934. (37) **Textilaria anceps**, *Rss.*
54935. (38) **Spiroplecta rosula**, *Ehrenb.* See above.

54935. (39) **Textilaria prælonga,** *Res.* Fragment.

54936. (40) „ **globulosa,** *Ehr.*, **T. aciculata,** *d'Orb.*, **Cristellaria** (small), &c. In a transparent slice of flint.

54939. (41) „ **pupa,** *Eley.*

54938. (42) **Verneuilina triquetra,** *Münster*, and **Globigerina cretacea,** *d'Orb.*
„ (43) **V. triquetra.**
„ (44) „?
„ (45) „ Young or small.
} Pl. 4. f. 22, p. 197; pl. 5. f. 31, p. 199; pl. 6. f. 36, 38, p. 200; and pl. 9. f. 38 C, p. 202.

54937. (46) **Gaudryina rugosa,** *d'Orb.* Pl. 6. f. 37, p. 200.

54940. (47) **Globigerina cretacea,** *d'Orb.* Pl. 2. f. 5 & 6, p. 194; and pl. 8. f. 6 C, p. 202.

54941. (48) „ **marginata,** *Rss.*, and **Dentalina communis,** *d'Orb.* Pl. 8. f. 5 C, p. 202.

54942. (49) **Planulina ariminensis,** *d'Orb.* Pl. 3. f. 16, p. 196; pl. 9. f. 16 C, p. 202.

54945. (50) **Planorbulina ammonoides** (*Reuss*).
54943. (51) „ „ (reversed).
„ (52) „ „ Showing stolon and foramina?
} Pl. 2. f. 3 & 4, p. 193; and pl. 8. f. 3 C, 4 C, A, C, p. 202.

54944. (53) **Pulvinulina Micheliniana** (*d'Orb.*).
54945. (54) „ „ „
} Pl. 5. f. 27, p. 198.

„ (55) **Rotalia umbilicata,** *d'Orb.*
„ (56) „ „ „
„ (57) „ ?, and **Globigerina cretacea,** *d'Orb.*
„ (58) „ ?
} Pl. 5. f. 24–26, 28, p. 198; and pl. 6. f. 35, p. 200.

„ (59) **Cristellaria rotulata,** *Lam.* See above.

54945*. **Calcarina Spengleri** (?). Rare. Given by the Rev. H. Eley to T. R. Jones.

With very many of these specimens Sponge-spicules occur in great abundance. See the Geol. Mag. vol. ix., March 1872, pp. 123–126, for a critical examination by Jones and Parker of the Foraminifera figured in the 'Geology in the Garden.'

P 147. Flint pebbles, broken and showing small nodular bodies containing **Lituola,** &c. Muswell Hill, &c. Wetherell Coll.

See paper by N. T. Wetherell in the 'Geologist,' vol. ii. (1859) p. 193.

CRETACEOUS. (British Isles.)

Chalk. Senonian Series.

IRELAND.

P 1154. Hardened Chalk, two miles N.W. of Lisburn, co. Antrim.

See T. Rupert Jones's paper "On the Microzoa of the Indurated Chalk of Antrim and Downshire," Proc. R. Geol. Soc. Ireland for November 1872.

CRETACEOUS.

SPAIN.

Cenomanian? Series.

21251. **Patellina (Orbitolina) lenticularis** (*Blumenbach*). In *Orbitolina*-rock, near Santander, north coast of Spain.

P 901. } **P. (O.) lenticularis** (*Blum.*); thin var. North Spain.
P 915. }

21258. **P. (O.) lenticularis** (*Blum.*). Santander, North Spain. *Orbitolina*-rock.

55167. **P. (O.) lenticularis** (*Blum.*). Santander, North Spain. Lloyd Coll.

21259. **P. (O.)**. Obscure, in dark-grey limestone, "with *Terebratula* (?) near *T. truncata*, Sow." Santander, North Spain.

96765. **P. (O.) lenticularis** (*Blum.*). Santander, North Spain. *Orbitolina*-rock. Lloyd Coll.

P 910. **P. (O.) lenticularis** (*Blum.*). Large and thin. Santander? Bright Coll.

P 911. **P. (O.)**; trochoid form. Navarres, in the North of Spain. T. R. Jones Coll.

P 913. **P. (O.)**; trochoid. Navarres, in the North of Spain.
„ "De la Craie du Montagne de Valence, Espagne." T. R. Jones Coll.

P 912. **P. (O.)**; plano-convex. "Chalk." Navarres, Valencia. T. R. Jones Coll.

FRANCE.

Albian? Series.

P 759. **Patellina (Orbitolina) lenticularis** (*Blumenbach*). "Gault. Escragnolles," Dépt. Alpes-maritimes; near Grasse.

Cenomanian Series.

P 35. **Patellina (Orbitolina) lenticularis** (*Blum.*). "Grès vert supérieur," Robions?, Dépt. Basses Alpes, S.E. France. Pratt Coll.

P 754. } **P. (Orbitolina) lenticularis?** (*Blumenbach*). Small form. In a mass of cream-coloured limestone, marked both "Kreide" and "Nummulitenschichte." Grasse, Dépt. Var, S.E. France. Probably Bruckmann Coll.
P 760. }

Senonian Series. Chalk.

50237. **Orbitoides papyracea** (*Boubée*), var., and **O. aspera (?)**, *Gümbel*.

Marked "*Orbitolites socialis*, Leym.," Mém. Soc. Géol. France, 2e sér. vol. iv. [p. 191], pl. 9 [fig. 5], "Crétacé supérieur à Gensac (Haute Garonne)."

50238. **O. papyracea** (*Boubée*), var.

Marked "*Orbitolites gensacica*, Leym.," Mém. Soc. Géol. France, 2e sér. vol. iv. [p. 190], pl. 9 [fig. 2], "Crétacé supérieur à Gensac."

P 758. **O. papyracea** (*Boubée*), var. Marked "**Fortisii**, var. A ; d'Arch., Mém. Soc. Géol. France, sér. 2, vol. iii. pl. 14. f. 6." France.

P 615. **O. Fortisii** (*d'Archiac*).
P 616. **Textularia** and débris of Polyzoa, &c. } Chalk (Senonian), Royan (Charente-Inférieure), France.
T. R. Jones Coll.

P 639. From the White Chalk with *Belemnitella mucronata*. Meudon, France.
Nodosaria Zippei, *Rss.*
Textularia (broken).
Planorbulina ammonoides, *Rss.* &c.
Entomostraca, &c. T. R. Jones Coll.

HOLLAND.

Maestricht Chalk (Senonian).

54875. 54876. 54877. } **Orbitolites macropora**, *Goldfuss*, Petref. Germ. t. 12. f. 8; and varieties. Maestricht. Van Breda Coll.

55128. 54873. } **Orbitoides Faujasii** (**Lycophris**, *Defrance*). Maestricht. Van Breda Coll.

P 626. **O. Faujasii** (*Defrance*). St.-Petersberg, near Maestricht. Dr. Bruckmann's Coll.

See Reuss, Sitzungsbericht d. k. Akad. Wiss. nat.-math. Cl. vol. xliv. 1861, p. 309, pl. 4. f. 7–9, and pl. 5. f. 1–5. This *Orbitoides* was wrongly referred to *Orbitolina* in Ann. & Mag. Nat. Hist. ser. 3, vol. vi. 1860; but it was set right by von Reuss and described in full in the memoir above referred to.

P 623. **Calcarina calcitrapoides** (**Siderolites**, *Lamarck*). Maestricht.

See Reuss, Sitzungsberichte d. k. Akad. d. Wiss. nat.-math. Cl. vol. xliv. 1861, p. 315, pl. 4. f. 1–6; also Ann. & Mag. Nat. Hist. November 1860, p. 341.

54875. **Calcarina** (broken). Maestricht. Van Breda Coll.

GERMANY.

(Pläner.)

P 625. **Flabellina cordata** (?), *Reuss.* On the weathered surface of a fossiliferous grey limestone. Plänerkalk. Strehlen (? Prussia, Breslau district). From the Museum of Practical Geology.

P 624. **Cristellaria rotulata**, *Lam.*, with a small **Flabellina** and numerous other small organisms, on the weathered surface of a grey limestone. Plänerkalk. Strehlen.
From the Museum of Practical Geology.

Weinbohla, Saxony.

Chalk. (Turonian ?)

P 614. **Nodosaria Zippei**, *Rss.* T. R. Jones Coll.

SWITZERLAND.

(Cenomanian ?)

P 723. **Patellina (Orbitolina)**; small. In dark-grey limestone, making up its mass, and standing out on the weathered surfaces of the little block. Marked "*Lenticulites*? Rare in the Alps." "See-Alp" (Lake Alp), Sentis, Canton of Appenzell. Bruckmann Coll.

P 713. **P. (Orbitolina)**. Obscure: rather small form; in greenish-grey sandy limestone, with the *Orbitolinæ* weathering reddish. Marked "rare." From the "Nummuliten étage" of the "Stheinthaler-Seite" (Stein-valley side) of the Faehnern, Canton of Appenzell, Switzerland. Bruckmann Coll.

CÆNOZOIC OR TERTIARY. (BRITAIN.)

ENGLAND.

TERTIARY: EOCENE.

Thanet Sand.

P 239. **Polymorphina gibba**, *d'Orb.* (**ampulla**, *Jones*). Quart. Journ. Geol. Soc. viii. p. 267, pl. 16. fig. 14.

„ **Nodosaria acicula**, *Lam.*

„ **Cristellaria italica**, *Defr.* (var. **Wetherellii**, *Jones*). *Op. cit.* p. 267.

„ **C. cultrata** (*Montf.*) (**platypleura**, *Jones*). *Op. cit.* f. 12.

„ **Truncatulina lobatula** (*W. & J.*) (var. **Mariæ**, *Jones*). *Op. cit.* f. 13.

London Clay.

49468. **Triloculina trigonula** (*Lam.*). Small. Haverstock Hill. Edwards Coll.

P 226. **Quinqueloculina triangularis**, *d'Orb.* Well at Hampstead. Wetherell Coll.

49477. **Quinqueloculina**, sp. near **lyra**, *d'Orb.* Haverstock Hill. Edwards Coll.

69407. **Trochammina incerta** (*d'Orb.*). Broken. Well at Hampstead. Wetherell Coll.

49478. „ „ „ }
49479. „ „ „ } Haverstock Hill. Edwards Coll.
49481. „ „ „ }

49506. **Trochammina?** Decomposed. Highgate. Edwards Coll.

P 226. **Verneuilina (Clavulina) communis** (*d'Orb.*). Hampstead Well. Wetherell Coll.

P 244. **Verneuilina (Clavulina) communis** (*d'Orb.*). Well at Finchley. Wetherell Coll.

49487. „ „ „ „ } Islington.
49489. „ „ „ „ } Edwards Coll.

P 226. **Nodosaria raphanistrum** (*Lin.*). Hampstead Well. Wetherell Coll.

49483. **N. raphanistrum** (*Lin.*)
49485. „ „ } Haverstock Hill.
49484. „ var. **Zippei**, *Reuss.* } Edwards Coll.
49486. „ and **raphanus** (*Lin.*).

P 229. **N. raphanus** (*Lin.*). Highgate Archway. Wetherell Coll.
49488. **N.** „ var. Haverstock Hill. Edwards Coll.
P 226. **N. badenensis**, *d'Orb.* Hampstead Well. Wetherell Coll.
54908. **N. raphanus**, varr., and **radicula** (*Lin.*). Finchley. „

49566. **N. spinosa**, *d'Orb.* } Islington. Edwards Coll.
49490. **N. spinulosa** (*Montagu*).

49491. „ „ } Haverstock Hill. „
49492. „ var.
49513. **N. soluta ?** *Reuss.*

P 231. **N.**, section. Barnet. Wetherell Coll.

49490. } **Dentalina acicula**, *Lam.* &c. Islington and Haverstock Hill.
49491. } Edwards Coll.
P 219. }

P 226. **D. spinulosa** (*Montagu*). Hampstead Well. Wetherell Coll.
P 241. „ „ Copenhagen Fields. T. R. Jones Coll.
P 243. „ „ } Finchley. Wetherell Coll.
D. communis, *d'Orb.*, varieties.

P 226. „ var. **elegans**, *d'Orb.* Hampstead Well. „
49564. **D. communis**, var. **elegans**, *d'Orb.*
49563. } „ var. **pauperata**, *d'Orb.* } Islington. Edwards Coll.
49565. }

49494. } „ var. **guttifera**, *d'Orb.* Haverstock H. „
49495. }

P 226. **D. Buchii**, *Reuss.* Hampstead Well. Wetherell Coll.
49500. **Marginulina similis**, *d'Orb.* ? Haverstock Hill. Edwards Coll.
54907. } **M. italica** (*Defr.*), var. **Wetherellii**, *Jones.* Hampstead Well and
P 226. } Finchley Hill. Wetherell Coll.
49498. **M. italica** (*Defr.*), var. **Wetherellii**, *Jones.* Haverstock Hill. Edwards Coll.
49499. **M. italica** (*Defr.*), var. **Wetherellii**, *Jones.* Islington. „

P 230. } **Marginulina** and **Cristellaria**, sections of. Well at Finchley and
P 244. } Tunnel near Chalk Farm. Wetherell Coll.

54907. P 244. **Cristellaria rotulata**, *Lam.* London and Birmingham Railway, near Chalk Farm, and Well at Finchley. Wetherell Coll.

49502. „ „ „ No locality. Edwards Coll.

49503. „ „ „ Haverstock Hill. „

49512. „ „ „ Small. Haverstock Hill. „

P 227. P 220. P 232. „ „ „ and **cultrata** (*Montf.*). Highgate Archway; Highgate Tunnel (1864). Wetherell Coll.

49512. „ „ „ (small), and **cultrata** (*Montf.*). Haverstock Hill. Edwards Coll.

49510. **C. rotulata**, *Lam.* (small), and **cultrata** (*Montf.*). Highgate. Edwards Coll.

P 226. **C. cultrata** (*Montfort*). Hampstead Well. Wetherell Coll.

49504. 49505. 49511. „ „ Haverstock Hill. Edwards Coll.

49510. „ „ Highgate. „

49514. „ „ Small. Islington. „

P 226. **C. italica**, *Defr.*, var. **Wetherellii**, *Jones*, Quart. Journ. Geol. Soc. xxii. p. 592. Hampstead Well. Wetherell Coll.

„ **Planorbulina Haidingerii**, *d'Orb.*, var. Hampstead Well. Wetherell Coll.

54907. „ „ with **Cristellaria rotulata**, &c. Finchley. Wetherell Coll.

P 226. **P. Akneriana**, *d'Orb.* Hampstead Well. „

P 242. **Truncatulina lobatula** (*W. & J.*), attached to *Vermicularia bognoriensis*. Tunnel near Chalk Farm. Wetherell Coll.

Figured in Ann. & Mag. N. H. 1839, p. 162. See also Morris's Catal. Brit. Foss. 1854, p. 44.

P 233. **Truncatulina?** (small). "From a well at Colney-Hatch Lane, depth 30 feet." Wetherell Coll.

TERTIARY: MIDDLE EOCENE.

ENGLAND.

Isle of Wight: White-Cliff Bay.

P 730. **Nummulites lævigata.** White-Cliff Bay, Isle of Wight. T. R. Jones Coll.

See Mr. Prestwich's paper, Quart. Journ. Geol. Soc. vol. ii. 1846, pp. 230 & 254 (referred to partly as *N. elegans*), and pl. 9. fig. 2.

Isle of Wight: Alum Bay.

Alum Bay, Isle of Wight,—Bed "No. 29" of Prestwich's paper (with section of Alum Bay), Quart. Journ. Geol. Soc. vol. ii. p. 257, pl. 9. fig. 1. Equivalent to

the lowest bed of the Barton series, according to the Rev. O. Fisher, Quart. Journ. Geol. Soc. vol. xviii. 1862, pp. 84, 86, 87, 93, 94. Referred to also by Sir C. Lyell, Quart. Journ. Geol. Soc. vol. viii. p. 334, note.

49472. **Quinqueloculina Hauerina**, *d'Orb.* Bed "No. 29." Edwards Coll.

P 234. } **Nummulites Prestwichiana**, *Jones.* Bed "No. 29." } J. Brown
P 235. } (**N. Wemlensis**, *De la H.**) } Coll.

P 237. „ „ „ In the glauconitic clay of bed "No. 29." Bean Coll.

P 238. „ „ „ In the glauconitic clay of bed "No. 29." Presented by T. R. Jones, F.G.S.

49525. „ „ „ Bed "No. 29." Edwards Coll.

N. variolaria (*Lam.*). Bed "No. 29." „

HAMPSHIRE: BRACKLESHAM.

36249. **Biloculina ringens** (*Lam.*). Dixon Coll.

49465. „ „ „ and varieties. Edwards Coll.

49464. **B. contraria**, *d'Orb.* „

49466. } **Triloculina trigonula**, *Lam.* „
49467. }

36248. **Quinqueloculina Hauerina**, *d'Orb.* Dixon Coll.

49469. } „ „ Edwards Coll.
49475. }

49470. „ „ Small, thick var. „

49476. **Q.** (rugose, n. sp. ?) „

49556. }
49557. } **Alveolina sabulosa** (*Montf.*) „
P 221. }

36254. **A.** ("**fusiformis**, *Sow.*") **sabulosa** (*Montf.*). Figured. Dixon Coll.
See Dixon's Geol. Sussex, 2nd edit. p. 172, pl. 10. fig. 5.

49558. { **Alveolina.** **A. ovoidea**, *d'Orb.* „ Longer var. } Edwards Coll.

P 196. **Alveolina Boscii**, *Defr.* (*sabulosa*, Montf.). „
"*Alveolina* limestone," from the Clibs†, a rock off Selsey.

P 727. **A. Boscii**, *Defr.* In *Alveolina* rock from the Mixen Rocks, Selsey. T. R. Jones Coll.

49562. **Polymorphina gibba**, *d'Orb.*, with a *Cythere*. (Bracklesham ?) Edwards Coll.

36250. **Operculina complanata** (*Defrance*). Dixon Coll.

* See letter in the sequel.
† Quart. Journ. Geol. Soc. xviii. pp. 70, 76, 80; and Dixon's Geol. Sussex, 2nd edit. p. 17.

30901. P 725. P 726. **Nummulites lævigata**†. In blocks of sandy Nummulitic Limestone. Various Coll.

P 434. „ „ In a piece of weathered Nummulitic rock. Edwards Coll.

49546. 49547. 49548. „ „ *Lam.* Brown, ferruginous sections. Edwards Coll.

40374. „ „ „ „ H. Keeping.

49541. 49542. 49543. 49544. 49559. P 733. „ „ Old and young. Edwards Coll.

49524. 49545. „ „ var. **scabra** (*Lam.*). „

23425. 23427. 36252. P 728. P 732. „ „ Old and young. Dixon Coll.

P 731. P 734*. „ „ Large.

8509. 8532. „ „ Mantell Coll.

P 236. **N. variolaria** (*Lam.*), rather small. "Upper part of the Brackleham series. Selsey."
Presented by the Rev. O. Fisher, M.A., F.G.S.

36255. **N. variolaria** (*Lam.*). Large. Dixon Coll.

36253. P 203. „ „ Small. „

49519. „ „
49518. „ „
49551. „ „
49554. „ „
49517. P 222. „ „ and Polyzoa &c.
P 202. P 214. „ „ and **N. Wemlensis**, *De la Harpe*, var. **Prestwichiana**, *Jones*.
49553. **N. Prestwichiana**, *Jones*.
P 197. „ (biconvex var.).
} Edwards Coll.

† *N. lævigata* here includes *N. Lamarcki*. See De la Harpe's letter in sequel.

36251. **Discorbina trochidiformis** (*Lam.*). Figured. Dixon Coll.
(= *Rotalia obscura*, Sow., Dixon's Geol. Sussex, 2nd edit. 1878, pp. 168 & 172, pl. 10. fig. 6.)
49516. **D. trochidiformis** (*Lam.*). Edwards Coll.
49561. „ „ „
P 222*. „ „ Rolled; with miscellanea. „

HAMPSHIRE: BARTON.

49463. **Biloculina?** Edwards Coll.
49471. **Quinqueloculina Hauerina**, *d'Orb.* „
P 215. **Miliolæ** (various). „
49507. **Cristellaria rotulata**, *Lam.* (Barton?) „
49501. **Marginulina Wetherellii**, *Jones.* „
49520. **Truncatulina lobatula** (*W. & J.*), with large chambers. „
49560. **Planorbulina rosea** (?), *d'Orb.* „
49515. **Discorbina trochidiformis** (*Lam.*). „
49523. } **Nummulites variolaria** (*Lam.*). „
49508. }
P 200. „ „ „ Large. „
49521. „ „ „ Large & flat (near Prestwichiana). Edwards Coll.
49526. **N. Prestwichiana**, *Jones.* „
P 201. } „ with **variolaria**, &c. „
P 217. }

HAMPSHIRE: GOSPORT.

P 729. **N. lævigata.** Gosport. T. R. Jones Coll.

See Mr. Pilbrow's paper in the Quart. Journ. Geol. Soc. vol. xvi. 1860, p. 447; also see vol. xviii. p. 76.

HAMPSHIRE: EMSWORTH, NEAR HAVANT.

For remarks on the *Nummulites* noted by Sowerby as from Emsworth, see Lyell's paper on the "Belgian Tertiaries," Quart. Journ. Geol. Soc. vol. viii. p. 350, *note*.
In a letter Prof. Prestwich informs me that he has searched in vain for the section with *Nummulites* at Emsworth, and that it may have been in a small temporary pit in a lane. The place itself is on the London Clay.

49522. **Nummulites Prestwichiana**, *Jones.* Edwards Coll.
P 216. „ „ and a **Turbinolia.** „
P 205. **N. variolaria** (*Lam.*), &c. „

HAMPSHIRE: STUBBINGTON.

P 236*. **Nummulites variolaria** (*Lam.*), rather large. "Upper part of the Bracklesham series." Presented by the Rev. O. Fisher, F.G.S.

49550.
P 213.
P 225. } **N. variolaria** (*Lam.*). Edwards Coll.

P 240. „ „ J. Brown Coll.

TERTIARY: OLIGOCENE.

BRAMSHAW.

See the Rev. O. Fisher's memoir "On the Bracklesham Beds of the Isle of Wight Basin," Quart. Journ. Geol. Soc. vol. xviii. p. 80.

P 220. **Triloculina oblonga?** (*Montagu*). Edwards Coll.
49474. **Quinqueloculina Hauerina**, *d'Orb.* „
49555. **Planorbulina Akneriana** (*d'Orb.*). „
59552. **Nummulites variolaria** (*Lam.*), large and thick. „
P 210.
P 211. „ „ with **Miliola** &c. „
P 218.
P 206. **N. Prestwichiana** and Polyzoa. „

BROOK.

See the Rev. O. Fisher's memoir, *tom. cit.* p. 82.

49549. **Nummulites Prestwichiana**, *Jones.* Edwards Coll.

HIGHCLIFF.

49567. This is most probably a *recent* specimen of **Orbitolites complanata**, *Lam.* Edwards Coll.
49473. **Quinqueloculina Hauerina**, *d'Orb.*, and other **Miliolæ**. „
49509.
49527. } **Nummulites variolaria** (*Lam.*). „
49528.
P 198.
P 209. } „ „ large. „
P 204. „ „ and thickish **Prestwichiana**. „

HORDWELL.

49480. **Trochammina incerta** (*d'Orb.*). "Upper Marine, Hordwell." Edwards Coll.

Isle of Wight.

49462. **Quinqueloculina Hauerina**, *d'Orb.*, small. Hempstead. Edwards Coll.

P 207. **Alveolina &c.**, rolled. "F. M. H." ,,

There are *Chara* also and marine Entomostraca from "F. M. H." (=Fluvio-marine Headon) in the Edwards Collection.

49482. **Nummulites variolaria** (*Lam.*), delicate var. like **N. venosa** (*F. & M.*). Headon Hill. Edwards Coll.

Clarendon Hill.

This section was in a railway-cutting three miles south of Southampton; Quart. Journ. Geol. Soc. vol. iii. p. 367. It exposed Lower London Clay only. The following fossil is therefore out of place:—

P 212. **Nummulites variolaria** (only one specimen). "Clarendon" [?]. Edwards Coll.

TERTIARY: PLIOCENE.

ENGLAND.

"Crag" of Suffolk, &c. Polyzoan, Lower, or White Crag (formerly termed "Coralline Crag").

23479. **Biloculina simplex**, *d'Orb.* Sudbourne. S. V. Wood Coll.
B. lunula, *d'Orb.* Sudbourne. ,,
Triloculina oblonga (*Montagu*). No loc. ,,
T. tricarinata, *d'Orb.* No loc. ,,
Textularia agglutinans, *d'Orb.* Gedgrave. ,,
Polymorphina compressa, *d'Orb.* Sudbourne. ,,
Planorbulina Ungeriana (?), *d'Orb.* No loc. ,,
Polystomella striatopunctata (*F. & M.*). No loc. ,,

P 682. P 683. **Miliola, Textularia, Polymorphina,** and **Planorbulina,** mixed. Orford. J. Brown Coll.

For some account of the Foraminifera of the Crag, see the "Monograph Foram. Crag," Pal. Soc. part i. 1866, by Messrs. Jones, Parker, and Brady.

Crag. Lower Crag; Suffolk Crag.

Aldborough.

P 689. **Nonionina umbilicatula** (*Montagu*). T. Rupert Jones Coll.

SUTTON, NEAR WOODBRIDGE.

P 708. **Biloculina ringens** (*Lam.*).
„ **Triloculina oblonga** (*Montagu*).
„ **Quinqueloculina seminulum** (*Lin.*).
„ **Spiroloculina planulata** (*Lam.*).
P 703. **Glandulina lævigata**, *d'Orb.*
„ **Dentalina communis**, *d'Orb.*
P 700. **Polymorphina lactea** (*W. & J.*).
„ **P. gibba**, *d'Orb.*
„ **P. gutta**, *d'Orb.*
„ **P. problema**, *d'Orb.*, &c.
P 698. P 707. **P. compressa**, *d'Orb.*
P 698. P 707. **P. variata**, *J., P., & B.*
P 701. **P. Orbignii**, *Zborz.* (**tubulosa**, *d'Orb.*).
P 704. **P. frondiformis**, *S. V. Wood?*
P 697. **P. complanata**, *d'Orb.*
„ **P. Thouini**, *d'Orb.*
P 702. **Textularia sagittula**, *Defr.*
„ **T. agglutinans**, *d'Orb.*
P 705. **T. gibbosa**, *d'Orb.*
P 699. **Pulvinulina repanda** (*d'Orb.*).
„ **P. pulchella**, *d'Orb.*, &c.
P 706. **Planorbulina Ungeriana**, *d'Orb.*
„ **Truncatulina lobatula** (*W. & J.*).
„ **Nonionina umbilicata**, *d'Orb.*
„ **Polystomella crispa** (*Lin.*).

} Collected by S. V. Wood.

Crag. Lower Crag: Cyprina-islandica Bed.

P 692. **Polymorphina.**
„ **Textularia.**
„ **Truncatulina.**
„ **Rotalia.**
„ **Nonionina.**

} T. R. Jones Coll.

Crag. Lower Crag: Cardita-senilis Bed.

P 693. **Polymorphina.**
„ **Textularia.**
„ **Truncatulina.**
„ **Rotalia.**
„ **Nonionina.**

} T. R. Jones Coll.

Upper Crag.

THORPE, NEAR NORWICH.

P 694. **Truncatulina lobatula** (*W. & J.*).
„ **Rotalia Beccarii** (*Lin.*).
„ **Nonionina umbilicata**, *d'Orb.*
} T. R. Jones Coll.

SOUTHWOLD.

P 695. **Truncatulina lobatula** (*W. & J.*).
„ **Rotalia Beccarii** (*Lin.*).
„ **Nonionina**, sp.
P 690. **N. striato-punctata** (*F. & M.*).
} T. R. Jones Coll.

CHILLESFORD.

P 691. **Rotalia Beccarii** (*Lin.*).
„ **Nonionina striato-punctata** (*F. & M.*).
} T. R. Jones Coll.

POST-TERTIARY.

BRITAIN.

Glacial Deposits (Shelly Boulder-clay). (HEBRIDES.)

55202. **Triloculina oblonga** (*Montagu*). Traigh Shuainoboist, Lewis.
„ **Quinqueloculina seminulum** (*Lin.*). „ „
55200. **Dentalina communis**, *d'Orb.*, var. **pauperata**, *d'Orb.* Traigh Shuainoboist, Lewis.
55198. **Truncatulina lobatula** (*W. & J.*). Traigh Chrois, Lewis.
55203. **Truncatulina** (broken). Traigh Shuainoboist, Lewis.
55199. **Truncatulina lobatula** (*W. & J.*). „ „
„ **T. refulgens** (*Montfort*). „ „
„ **Nonionina depressula** (*W. & J.*). „ „
55204. „ „ „ Traigh Chrois, Lewis.
55195. **N. asterizans** (*F. & M.*). „ „
55196. „ ? (worn). Traigh Shuainoboist, Lewis.
55197. **Polystomella crispa** (*Lin.*). „ „
55201. **P. striato-punctata** (*F. & M.*). „ „

For an account of the deposits yielding these Foraminifera, see "Note on the Fossils from the Glacial Deposits of the North-west Coast of the Island of Lewis, Outer Hebrides," by R. Etheridge, jun., F.G.S., 'Geological Magazine,' dec. ii. vol. iii. 1876, p. 552, &c.

P 696. **Nonionina striato-punctata** (*F. & M.*). Boulder-Clay.
„ **Miliola.** Burn of Haster, near Wick, Caithness.
} Jos. Anderson Coll.

ENGLAND.

P 688. **Polystomella crispa** (*Lin.*). "From sand, Waterbeach, near Chichester," Hants. J. Brown Coll.
Specimens numerous, with some quartz and other sand, and fragments of bivalve shells.

See Prof. Prestwich's paper on the westward extension of the Raised Beach of Brighton, Quart. Journ. Geol. Soc. vol. xv. p. 218, where a section of the Waterbeach sand-pit is given.

TERTIARY. (EUROPE.)

NORTH GERMANY: PRUSSIA.

"*Lower Oligocene of Latdorf, near Bernberg.*"

48976. "**Triloculina trigonula** (*Lam.*)."
48969. "**Nodosaria ? baculoides**, *Gm.*" (*Dentalina communis* &c.)
48984. "**N. aciculata**, *Phil.*"
48975. "**Planularia intermedia**, *Phil.*"
48954. "**Nonionina magdeburgica**, *Phil.*" (*Cristellaria rotulata* and *cultrata.*)
48968. "**Glandulina.**" (*Polymorphina.*)
48982. "**Guttulina.**" (*Polymorphina.*)
48977. "**Rotalina discifera**, *Phil.*"
48983. "**Asterigerina.**"
48981. "**Sexloculina Haueri**, *Cj.*" (*Sphæroidina.*)
48985. "**Nummulites mamillatus.**" (*Nummulites*, near *N. Prestwichiana.*)
48980. "**Lenticulites.**" (*Nummulites striata* ?)
48970–4. 48978. "**Foraminifera.**"

TERTIARY: EOCENE.

GERMANY ?

34036. P 771. **Nummulites** near **N. garansensis**, *Joy et Leymerie*, but much larger and thicker; more finely scabrous than d'Archiac's figures (pl. 3). In a weathered block of Nummulitic limestone, hard, white, and foraminiferal.
"Würtemberg" [?]. "Old Collection."

SWITZERLAND*.

P 718. **Orbitoides papyracea** (*Boubée*), with **O. patellaris** (*Schl.*). In an *Orbitoides*-rock. Marked "*Orbitolites discus*, Rütimeyer, Ralligstocke (Lac de Thoune)."

* See, for particulars of the Nummulites of the Western Alps, the memoir by Dr. P. De la Harpe in the Actes de la 60e Session de la Soc. Helv. des Sc. Nat., Bex, Août 1877, art. x., 8vo, 1878.

See Dr. L. Rütimeyer's memoir on the Nummulitic Terrain of the district between the Lake of Thun and the Emme ("Ueber das Schweizerische Nummulitenterrain," &c.), 4to, Berne, 1850, with map and plates.

P 715. **Nummulites striata,** *d'Orb.* Marked "*N. Perriblanci.*" In black limestone. "Vaud. P. M. Renevier."
From the Museum of Practical Geology.

P 716. **Operculina ammonea,** *Leym.* In black limestone. "Val d'Illier, Vaud. P. M. Renevier." From the Museum of Practical Geology.

There is much doubt as to these specimens. Prof. E. Renevier, having been asked about them, kindly replied thus:—

"Lausanne, 15th November, 1881.

"DEAR SIR,—I have no remembrance whatever, nor has Dr. De la Harpe, of the two specimens you write about. I doubt that they came from me.

"Val d'Illier is in *Bas-Valais*, running from Mouthey (famous Moraine) to Savoy (not in Vaud). There are all kinds of Terrains; Eocene=Nummulitic forms a band all along on the foot of the Chain of Dent du Midi, in beds generally reversed, and covered by Gault and Neocomian! There is no *N. Periblanci*! Periblanc is a locality in Alpes Vaudoises, where only *N. striata* is found. In Val d'Illier, De la Harpe has ascertained five species of Nummulites—*N. Ruetimeyeri, Chavanessi* *, *Boucheri* *, *Fichteli*, and *intermedia*.

"Ever yours,
"E. RENEVIER, Prof."

P 711. **Assilina exponens** (?), *Sow.*, with *N. biaritzensis*, d'Arch. &c. In hard, dark-grey, weathered limestone. Labelled by Sir R. I. Murchison, "Nummulitic rock; the Schwendberg, west of Eindeln, Canton Schwyz." Murchison Coll.

See Quart. Journ. Geol. Soc. vol. v. p. 186 &c.

P 712. **A. exponens,** var., with *N. Ramondi* (?), Defr., and *Orbitoides papyracea* (Boub.). In a ferruginous gritty limestone. Marked by Sir R. I. Murchison "Same species as at Dörnbirn," in the Vorarlberg. St. Pancras, Hundsberg. Murchison Coll.

See Quart. Journ. Geol. Soc. vol. v. pp. 203, 242, & 246.

P 830. **A. exponens,** in a dark-coloured limestone, with *Orbitoides papyracea*, shells, and glauconite. Marked by Sir R. I. Murchison "VIII. *N. assilinoides.* Nummulitic rock (f). Fähnern," Canton Appenzell.

See Murchison's Memoir on the Alps &c., Quart. Journ. Geol. Soc. vol. v. p. 201 &c.

A. exponens. Smooth and much flattened. With small *Nummulina Ramondi* (?), in soft sandy limestone, weathering rusty.
Probably Murchison Coll.

P 717. **Nummulites biaritzensis,** *d'Arch.* (some with glauconitic interiors) and **Orbitoides papyracea,** var. **Fortissii**? In a dark-grey Nummulitic limestone, weathering rusty, and showing some fine natural dissections of the interiors. Marked "Subalpine formations, Quenstedt. Nummulitic stage. Upper Alpine Limestone. Fähnern, in Appenzell, Switzerland."
Bruckmann Coll.

* "Near *N. striata.*"

P 710. **Nummulites** (**N. biaritzensis** &c.) and **Orbitoides**, in dark-grey Nummulitic limestone. "Steinbruch-Dabel," Fähnern, Cent. Appenzell. Probably Bruckmann Coll.

P 720. **Nummulites biaritzensis** (?) and **Orbitoides**, with Shark's tooth, in glauconitic Nummulitic limestone. Fähnern. Bruckmann Coll.

P 709. **Nummulites** and **Orbitoides**, some with glauconitic infillings. In a glauconitic ironstone. "Alp-Fähnern," Appenzell. Probably Bruckmann Coll.

P 724. **Nummulites Puschi?** and **N. biaritzensis**, some with glauconitic infillings. In glauconitic ironstone. Alp-Fähnern, Appenzell. Probably Bruckmann Coll.

P 719. **N. biaritzensis**, *d'Arch.* "Subalpine formation." Fähnern, in the Canton Appenzell. Bruckmann Coll.

P 1155. **N. biaritzensis**, **N. Lucasana**, and **Orbitoides** (rugose var. of **papyracea?**), in a dark-grey sandy Nummulitic limestone. Bruckmann Coll.

P 714. **Nummulites** (only median sections), in dark-grey Nummulitic limestone (breccia), weathering rusty. Fähnern, Appenzell. Bruckmann Coll.

BAVARIA.

Kressenberg.

See the 'Geognostische Beschreibung des bayerischen Alpengebirges und seines Vorlandes,' von C. W. Gümbel, 8vo, Gotha, 1861, pp. 645 &c. and 653 &c., pl. 26. fig. 194 (a plan of the Kressenberg Mining Works); and map (north-central part), with section, no. v. (Blatt Berchtesgaden). This section passes in a south-eastward direction, from Hochberg on the Traun by Neukirchen (near which, to the south, is Kressenberg), over the Teisenberg to Reichenhall, &c.

The Kressenberg group is an *inlier* (by faulting) of the Lower Nummulitic beds between Flysch (Upper Nummulitic) on one side (Teisenberg) and later Tertiary (Oligocene Molasse) on the north-west.

P 809. **Nummulites complanata**, *Lam.* Cut and polished piece of glauconitic Nummulitic rock. Kressenberg.

P 829. **N. complanata** and **Orbitoides papyracea.** Cut and polished piece of glauconitic Nummulitic rock. Kressenberg.

P 798. **Pulvinulina Haidingeri** (*d'Orb.*). **Truncatulina lobatula** (*W. & J.*). Thick form. Götzreuth, Kressenberg. Zittel Coll.

P 784. "**Heterostegina reticulata**, *Rütimeyer*" (?).

P 796. "**Operculina Murchisoni**, *Brunner*, sp." With *Orbitoides papyracea* (Boubée), *Assilina*, &c., in dark-red gritty marl. Max-Joseph-Querschlag, Kressenberg. Zittel Coll.

P 824. **Operculina granulosa**, *Leymerie.* Many. Kressenberg.

P 823. **O. ammonea**, *Leym.* Few. With intermediate forms. Jobstein-bruch, Kressenberg. Zittel Coll.

P 814. **Assilina exponens** (*Sow.*). Smooth. Kressenberg. Zittel Coll.

54863. „ „ „ Adelholzen, near Traunstein. Krantz Coll.

P 814. „ „ Light-coloured. Adelholzen, near Kressenberg. Zittel Coll.

P 787. „ „ Middle-sized, flat, smooth. From the Flysch of the Kachelstein, near Teisenberg, Bavaria. Zittel Coll.

P 826. **A. exponens.** Some smooth; some worn smooth. "Suessonien Carrière près de Neukirchen (Bavière)." This is marked "*Assylina depressa*, d'Orb.," which is *A. spira* according to d'Archiac. Tesson Coll.

54863. **A. exponens.** Very flat and smooth; one has rather stronger septal lines. Adelholzen, near Traunstein. (Krantz.)

P 803. **A. exponens.** Small, flat. Kressenberg. Zittel Coll.

31155. „ var. **granulosa**, *d'Arch.* Kressenberg. P. Mohr Coll.

55132. „ „ „ In quartzose grit with glauconite. Kressenberg.

P 827. „ „ „ Dark-coloured. Maxflötz, Kressenberg. Zittel Coll.

31157. „ var. **mamillata**, *d'Arch.*, and **Nummulina biaritzensis**, *d'Arch.* All waterworn. Kressenberg. P. Mohr Coll.

31158. **A. exponens**, var. **mamillata**, *d'Arch.* Kressenberg. „

P 804. } P 817. } „ „ „ „ Zittel Coll.

P 815. „ „ „ Adelholzen, Kressenberg. Zittel Coll.

P 803*. „ var. **Leymerii**, *d'Arch.* Jobstensteinbruch, Kressenberg. Zittel Coll.

55132. **Nummulites complanata**, *Lam.* A thin and flexuous variety of *N. perforata* (Montf.). In a quartzose grit with glauconite. Kressenberg.

P 795. **N. complanata**, *Lamarck.* Some curved. Zittel Coll.

P 800. „ „ Dark-coloured like the ironstone matrix of some other specimens. Kressenberg.

P 808. **N. complanata**, *Lamarck.* Waterworn; ferruginized. Salzburg? Klipstein Coll.

31154. „ „ Large specimen. Kressenberg. P. Mohr Coll.

52182. „ „ Two large thin specimens. Marked "*Nummulites orbiculatus*, Schaffhäult." *N. Dufrenoyi*, d'Arch., according to Gümbel. Neukirchen, at the Kressenberg in Bavaria.

P 811. **N. complanata**, *Lamarck.* Five large specimens, with some attached *Assilinæ*, some of which have their chambers filled with glauconite. "Subalpine formation." Bruckmann Coll.

P 828. **N. complanata,** *Lam.* Three large specimens. From the Höllgraben, near Adelholzen, Kressenberg. Zittel Coll.

P 805. **N. complanata,** *Lam.* Höllgraben, Traunstein (Bavaria). Tesson Coll.

31156. **N. complanata,** *Lam.* Thick var., curved like *Orbitoides ephippium* (Sow.). Kressenberg. P. Mohr Coll.

The large thin specimens of *N. complanata* are the same as *Nummulites orbiculatus,* Schafhäult, *N. Dufrenoyi,* d'Arch., *N. complanata,* Lam., var. *planissima,* De la Harpe. Gümbel says (p. 666) that *N. complanata* is the same as Schafhäult's *N. orbicularis-maxima,* and that *N. Dufrenoyi,* d'Arch., is *N. orbiculatus,* Schafh.

55132. **N. lævigata,** *Lam.* In a quartzose grit with glauconite. Kressenberg.

P 818. **N. "pseudolævigata,** *Barth. in litteris."* Discoloured, and impressed with granules of iron-oxide. Kressenberg.

54863. **N. biaritzensis,** *d'Arch.* Adelholzen, near Traunstein. Krantz Coll.

P 816. „ „ Kressenberg. Zittel Coll.

P 791. „ (?) „ "*N. helveticus,* Kaufmann, *fide* v. Suttner." Adelholzen, Kressenberg. Zittel Coll.

P 790. **N. striata,** *d'Orb.* Jobstensteinbruch, Kressenberg. „

55132. **N. Ramondi,** *Defr.* In quartzose grit with glauconite. Kressenberg.

P 792. **N. Ramondi** (?), *Defr.* Surface obscured by dark matrix and imprints of granules. Jobstensteinbruch. Zittel Coll.

P 801. **N. variolaria** (*Lam.*), with **Operculina granulosa,** *d'Arch.* Jobstensteinbruch, Kressenberg. Zittel Coll.

P 797. **N. variolaria** (*Lam.*). Götzreuth, Kressenberg. „

P 821. } **N. Lucasana** (*Defr.*). Ferruginized and impressed by granules.
P 822. } Kressenberg. Zittel Coll.

54864. **Orbitoides papyracea,** *Boubée.* (Including *Orbitoides Fortisii,* d'Arch., according to Gümbel, For. Eoc. 1868.) In a ferruginous grit, or quartzose grit with a matrix of oolitic ironstone. Large, flat, and thin; surface pitted, broken, and obscured by grit and oolitic limonite.

P 812. **O. papyracea,** *Boubée.* Matrix as with 54864. Kressenberg.

P 807. „ „ „ „ with shark-teeth. Kressenberg. Zittel Coll.

P 806. **O. papyracea,** *Boubée.* In ferruginous grit (as 54864), termed "granular clay-ironstone" on the label. Kressenberg, near Traunstein.

P 819. **O. papyracea,** *Boubée.* In greenish-grey friable quartzose grit, with glauconite. "Subalpine formation. Kressenberg." Bruckmann Coll.

P 806. } **O. papyracea,** *Boubée.* Some of medium size; some larger.
P 813. } Rather rugose. Some pitted by the granular iron-ore. Kressenberg. Murchison Coll.

P 794. O. **papyracea**, *Boubée*. In greenish-grey rock. Max-Joseph Querschlag, Kressenberg. Zittel Coll.

55132. O. **papyracea**, *Boubée*. In quartzose and glauconitic grit. Kressenberg.

54863. „ „ Adelholzen, near Traunstein. (Krantz.)

54863. „ „ var. „ „ „

55132. „ „ „ **Fortisii**, *d'Arch.* See Gümbel, Foram. Eocän., Bayer. Akad. 1868, pl. 3. f. 11, 12. Dark-coloured; slickensided by squeeze. Kressenberg.

P 810. O. **papyracea**, *Boubée*, var. **Fortisii**, *d'Arch.* Like 55132. Kressenberg. Zittel Coll.

„ „ „ „ „ Large and thin, flat and curved. Surface smooth, showing delicate tubercles; some specimens slightly rugose. Some are roughened, slickensided, and striated by the sand-grains of the matrix, which is a greenish-grey friable sandstone, passing into a quartzose grit with glauconite. Maurerschurf, Kressenberg. Zittel Coll.

P 785. O. **dispansa**, *Sow.* Kressenberg and Hammer. „

P 783. O. **aspera**, *Gümbel*. Of middle size. Rollgraben, Kressenberg. Zittel Coll.

P 789. O. **tenella**, *Gümbel*. Spirkergraben, Kressenberg. „

P 786. O. **applanata**, *Gümbel*. Hammer, Kressenberg. „

P 825. O. "**nummulitica**, *Gümbel*. Kressenberg, v. Hammer." „

P 788. O. **tenuicostata**, *Gümbel*, or var. of **radians**? Rollgraben, Kressenberg. Zittel Coll.

P 799. O. **variecostata**, *Gümbel*, or var. of **radians**? Götzreuth, Kressenberg. Zittel Coll.

P 802. O. **patellaris**, *Schloth.* In ferruginous limestone. Hinterleithen, Kressenberg. Zittel Coll.

P 820. O. **stellata**, *d'Arch.* Rollgraben, Kressenberg. „

P 793. O. **stella**, *Gümbel*. „ „ „

ANGLO-FRENCH AREA OF NORMANDY &c.

Channel Islands and off Scilly Islands.

P 981. **Alveolina Boscii** (*Defr.*).
„ **Truncatulina Dutemplei**, *d'Orb.* (thicker).
P 979. } **Discorbina trochidiformis** (*Lamk.*).
P 980. }
P 978. **Nummulites Rouaulti**, *d'Arch. & H.*
„ **N. Ramondi**, *Defr.*
„ **N. Prestwichiana**, *Jones* (**N. Wemelensis**, var. **Prestwichiana**).

} Dredged by Prof. D. T. Ansted off Guernsey.

P 977. **N. Rouaulti**, *d'A. & H.* } Dredged by Mr. MacAndrew and Dr. S. P. Woodward 40 miles south of the Scilly Isles.
„ **N. Ramondi**, *Defr.* }

For an account of these fossil and, in most cases, much-rolled Foraminifera, dredged up from the bed of the English Channel, see the paper by Messrs. Jones and Parker, in the Ann. & Mag. Nat. Hist. April 1876, p. 283 &c.

BELGIUM.

P 995. **Nummulites lævigata**, *Lamarck.* Small specimens. Laeken, Belgium. De Koninck Coll.

P 994. **N. lævigata.** Large specimens. Belgium and Brussels. De Koninck Coll.

P 997. „ From the "Grès fistuleux," Brussels.

P 995. „ var. **scabra** (*Lam.*). Laeken. De Koninck Coll.

P 999. „ „ „ „ and globose var. Brussels.

36259. P 1000. } **N. planulata** (*Lam.*). Belgium; and Ghent, Belgium.

P 1003. „ Forêts, Brussels.

P 1002. „ Renaix, Brussels. With glauconitic casts. Sandy Nummulitic limestone.

For an account of the distribution of Nummulites in the Middle Eocene strata of Brussels and its vicinity, see Sir C. Lyell's Memoir "On the Belgian Tertiary Formations," Quart. Journ. Geol. Soc. vol. viii. 1852, pp. 279, 332, 335, &c.

P 1001. **N. planulata** (*Lam.*). Mons, Belgium.

„ „ "var. **crassa.**" Mons, Belgium. Small, biconvex.

P 1004. **Nonionina striato-punctata.** } "Upper Sands" (Pliocene).
„ **Cristellaria italica**, *Defr.*, var. } Antwerp.

FRANCE.

Northernmost France.

P 975. **Orbitolites complanata**, *Lamarck.* Large specimen in a Foraminiferous granular limestone with Mollusks, Serpulæ, &c. Middle Calcaire grossier. Orglandes, Dép. de la Manche: 326 kilomètres west from Paris, and 10 kilom. from the Station of Chef-du-Pont on the Cherbourg line. T. Rupert Jones Coll.

P 975. **O. complanata**, *Lamarck*, with smaller Foraminifera, Polyzoa, and shells. In a mass. Orglandes, Dép. de la Manche. T. Rupert Jones Coll.

P 990. **O. complanata**, *Lamarck.* With Polyzoa, Mollusca, &c. Hautville, Normandy.

P 976. **Discorbina trochidiformis** (*Lam.*), **Miliola**, &c. Eocene, Normandy. T. Rupert Jones Coll.

P 945. **Nummulina lævigata,** *Lam.* Large and small. Cassel, Dép. du Nord *. T. Rupert Jones Coll.

P 968. **N. lævigata,** *Lam.*, and var. **scabra,** *Lam.* In granular, sandy, glauconitic limestone. Cassel?

P 945. **N. lævigata,** *Lam.*, and var. **scabra,** *Lam.* Cassel. T. Rupert Jones Coll.

" " " " " " In its globose or cherry-stone form. Cassel. T. Rupert Jones Coll.

P 988. **Nummulites variolaria** (*Lam.*). Auvers (Oise), about 30 miles north of Paris.

See Lyell, Belg. Tert., Quart. Journ. Geol. Soc. vol. viii. p. 333.

P 974. **Operculina complanata** (*Defrance*), var. **granulosa,** *d'Arch.* Auvers.

P 935. **Quinqueloculina Juleana** (?), *d'Orb.* Calcaire grossier. Parnes (Dép. Oise), about 50 miles N.W. of Paris. It is a district with many pits. (Prof. Prestwich in letter.)

P 951. **Q. saxorum** (*Lam.*). Paris.

P 940. P 963. **Fabularia discolithus,** *Defrance.* France.

P 917. P 919. P 939. **Orbitolites complanata,** *Lamarck.* Various specimens; one in sandy shell-grit limestone. Gisors (Dép. Eure), and elsewhere in France.

P 921. P 929. **Alveolina Boscii,** *Defr.* P 923. **A. sabulosa** (*Montf.*). Calcaire grossier. Parnes, Gisors, and elsewhere in France.

P 938. **Ovulites margaritacea,** *Lam.* Calcaire grossier. Parnes (and elsewhere?).

P 934. **Discorbina trochidiformis** (*Lam.*). Calcaire grossier. Parnes and Chaussy (Oise).

P 983. **Operculina complanata** (*Defr.*). Calcaire grossier. Grignon (Dép. Seine et Oise). About 12 miles S.W. of Paris (near Versailles). The pit has long been closed (Prof. Prestwich). Deshayes Coll.

33398. **Nummulites lævigata,** *Lam.* Lower Calcaire grossier. Septmons, near Soissons (N.E. of Paris), Dép. d'Aisne. 100 kilom. north of Paris, near the station of Berzy-le-Sec on the Soissons line, and 6 kilom. S.E. of Soissons. Presented by R. C. Hussey, Esq.

P 922. **N. lævigata,** *Lam.* "Calcaire grossier inférieur." Soissons.

P 947. " " Soissonnais.

* In Sir C. Lyell's Memoir "On the Belgian Tertiary Formations" (Quart. Journ. Geol. Soc. vol. viii. 1852, p. 324) there is some account of the Nummulitic beds at Cassel in French Flanders, with a section of the Hill of Cassel. See also Prof. Prestwich "On the British and Foreign Tertiaries," Quart. Journ. Geol. Soc. vol. xi. 1855, pp. 232 & 241, pl. 8. fig. (section) 1.

P 944. **N. lævigata**, *Lam.* Vaugirard (2½ miles S.W. by W. from Paris), Dép. Seine et Oise.

P 916. „ „ Compiègne (?), Dép. Oise.

In sandy Nummulitic limestone like that of Compiègne. An interesting specimen; for one exposed chamber-plane shows a dichotomy of the spire, like that figured by Schafhäult in the 'Südbayerisch' &c., 1863, pl. 6, "ZZ 40."

P 991. **N. lævigata**, *Lam.* "Calcaire grossier." Compiègne (33 miles N. by E. from Paris), Dép. Oise.

P 972. **N. lævigata**, *Lam.* Les Moutiers en Cinglais. (French Flanders?)

7088. „ „ Gomersfontaine, Dép. Oise. "Calcaire grossier." Mantell Coll.

P 984. „ and var. **scabra** (*Lam.*). Near Paris.

P 982. „ „ „ „ „ In sandy Calcaire grossier, with shells, Foraminifera, &c.

P 918. „ „ „ „ Issy (4 miles S.W. by W. from Paris), Dép. Seine et Oise. In granular sandy Calcaire grossier.

P 924. „ „ „ „ Mont Ganelon, N.E. of Compiègne, Dép. Oise. In sandy Nummulitic limestone. Labelled by Edward Forbes, 1853. From the Museum of Practical Geology.

P 946. „ „ „ „ Chantilly (17 miles N. from Paris), Dép. Oise.

P 56. „ „ „ „ Lower Calcaire grossier. Ribecourt, Dép. Oise. 97 kilom. N. of Paris, with a station of the Terguin-Mons line.

P 943. „ „ „ „ Chaumont (29 miles N.W. from Paris), Dép. Oise.

P 989. „ „ „ „ France. In a piece of granular Nummulitic limestone, cut and polished.

P 992. } **N. planulata** (*Lam.*). Large and small. "Sables inférieurs."
P 998. } Soissons, Dép. d'Aisne. Deshayes Coll.

P 954. „ „ Laon (16½ miles N. of Paris), Dép. d'Aisne.

P 996. „ „ "Paris."

P 985. „ „ With **Alveolina** and **Orbitolites complanata**. Gisors (35 miles N.W. from Paris), Dép. Eure.

54986. **N. planulata** (*Lam.*). Cuisse-la-Motte (N.W. of Paris), Dép. Oise. Hard quartzose and glauconitic sandstone full of the Nummulites.

P 933. P 948. } „ „ Large and small. Cuisse-la-Motte.

P 987. „ „ Chaumont, Dép. Oise. Cemented into a mass together with some glauconite.

P 969. **N. variolaria** (*Lam.*). Sables moyens. Betz (Dép. Oise), on the road from Paris to Soissons. Cemented into a mass, together with quartz-sand, glauconite, and Polyzoa.

P 986. „ „ Sables moyens. "Marg." (Margny). Deshayes Coll.

P 969. „ „ Chaumont, Dép. Oise. Some of the specimens cut and polished.

6942. **Biloculina ringens** and **Triloculina trigonula.** Paris Basin. Mantell Coll.

6941. P 964. } **Triloculina trigonula** (*Lam.*). Paris Basin. „

6943. **Pulvinulina repanda** (*d'Orb.*). Paris Basin. „

6937. 6939. P 931. } **Discorbina trochidiformis** (*Lam.*). Paris Basin. „

P 941. „ „ „ Middle Calcaire grossier. "Freville." Fresville is in the Dép. Manche, 7 kilom. E. of Orglandes (see p. 35), and 332 kilom. from Paris on the Cherbourg line.

P 942. **Alveolina sabulosa** (*Montf.*). Middle Calcaire grossier. "Freville."

P 941. **Dactylopora cylindracea**, *Lam.* &c. „ „

P 931. **Biloculina ringens** (*Lam.*).
„ **Triloculina Hauerina**, *d'Orb.*
„ **Triloculina trigonula.**
„ **Peneroplis (Spirolina).**
„ **Ovulites margaritacea**, *Lam.*
„ **Discorbina trochidiformis.**
} Calcaire grossier. Fercourt (Dép. Oise), a hamlet of Cauvigny, 68 kilom. N.E. of Paris, on the Beauvais line, by Beaumont and Hermez; Cauvigny station. Both Lower and Middle Calcaire grossier occur here (G. Dollfus). T. Rupert Jones Coll.

P 1156. **Ovulites, Alveolina, Miliola,** and shells. "Calcaire grossier moyen." Chaussy (Oise). T. Rupert Jones Coll.

P 920. **O. margaritacea.** Calcaire grossier inférieur. Damery (Marne), near Epernay, 80 miles E. of Paris. "The section is a fine natural exposure by the side of a brook, high up on a hillside, and is always open" (Prof. Prestwich in letter). T. Rupert Jones Coll.

P 930. **Alveolina ovoidea**, *d'Orb.* Lower Eocene. Sables inférieurs. Cuise (Cuise-la-Motte), Dép. Oise, 84 kilom. N. of Paris. T. Rupert Jones Coll.

P 965. **A. oblonga**, *d'Orb.* Soissons.

P 914. **Miliola, Discorbina**, &c., with shells. From the Sable de Beauchamp. Le Guépelle, près Senlis (Oise). T. Rupert Jones Coll.

P 926. Tertiary (Middle Eocene) shelly limestone from Paris, consisting largely of Foraminifera (chiefly **Miliolæ**). The building-stone of Paris. T. Rupert Jones Coll.

P 932. **Miliolæ.** Calcaire grossier. Paris.

South France (Western side).

P 927. **Nummulites** (small). In a weathered piece of brownish limestone. Aurignac, Dép. Haute Garonne. T. Rupert Jones Coll.

P 928. **Alveolina, Miliola**, &c. In cream-coloured limestone. Aurignac. T. Rupert Jones Coll.

P 925. **Alveolina.** In a thin slice of *Alveolina*-limestone, with **Miliola**, other Foraminifera, and shells. Dép. Hérault.

69901. **Nodosaria raphanistrum** (*Linné*), var. "**enneagona**, Al. R." (Raulin). Bos d'Arros, near Pau, Dép. Basses Pyrénées.

54859. **N. intermittens**, *Reuss.* Perpignan, Dép. Pyrénées orientales. L. Saemann Coll.

69920. **Operculina ammonea**, *Leymerie.* Bos d'Arros, near Pau.

P 757. **Assilina exponens** (*Sowerby*). Large and smooth. Sort, near Dax, Dép. Landes.

P 757. **A. exponens** (*Sowerby*), var. **granulosa**, *d'Arch.* Dax, Dép. Landes.

54910. „ „ „ „ Bos d'Arros, near Pau.

P 742. **Nummulites intermedia**, *d'Arch.* Tuc de Saumon à Lié, Dax.

P 745. **N. mamillata**, *d'Arch.* Montfort, near Dax.

P 744. „ „ Entre Montfort et Douzacq, Dax.

P 743. **N. planulata** (*Lam.*). Rather small. St.-Martin, Dax.

54909. „ „ With **N. variolaria*** and **Cristellaria.** Bos d'Arros, near Pau, Dép. Basses Pyrénées.

P 740. **N. Dufrenoyi**, *d'Arch.* Nousse, Dax.

P 952. **N. complanata** (*Lam.*). Thin variety. } Nousse, near Dax, Dép.

P 953. „ „ Thicker var. } Landes.

„ „ „ Montfort, Dax.

P 955. „ „ Entre Montfort et Douzacq, Dax.

30192. „ „ Dép. Basses? Pyrénées. Of medium size; split open and waterworn. Pratt Coll.

54910. **N. biaritzensis**, *d'Arch.* Bos d'Arros, near Pau.

P 739. } **N. Rouaultii** (*Defr.*), large. Ste.-Marie; medium and small,

P 741. } Montfort, Dax.

* For a note on the association of *N. planulata* and *N. variolaria*, see Lyell "On the Belgian Tertiaries," Quart. Journ. Geol. Soc. vol. viii. p. 333, note.

P 756. **N. placentula,** *Deshayes.* Ossun, Dép. Hautes Pyrénées.
Tertiary: Miocene. Bordeaux.

Sands No. 1:

P 752. **Operculina complanata** (*Defr.*).
„ **Amphistegina.**

Sands No. 2:

P 750. **Textularia.**
„ **Miliola.**
P 753. **Truncatulina.**
„ **Nonionina.**

Sands No. 3:

P 751. **Operculina complanata** (*Defr.*).
P 749. **Tinoporus (Gypsina).**
P 747. P 748. **Nonionina, &c.**

} T. Rupert Jones Coll.

P 956. **Operculina complanata** (*Defr.*). Dax, near Bordeaux.
P 960. **Amphistegina communis,** *d'Orb.* „ „
P 957. **Dendritina arbuscula,** *d'Orb.* Bordeaux.
P 746. **Cristellaria,** &c. „

SOUTH FRANCE (Eastern side).

EOCENE.

P 738. **Nummulites striata,** *d'Orb.* (*Ramondi,* Defr.). Foudan, Dép. Hautes Alpes.

BAYONNE AND BIARITZ * (Département Basses Pyrénées), SOUTH-WEST FRANCE.

P 341. **Nummulites scabra?,** *Lam.* Bayonne. Pratt Coll.
30188. **N. perforata** (*Montf.*). Ten specimens of different sizes, and varying from smooth to scabrous. Biaritz? Pratt Coll.
P 339. **N. perforata, biaritzensis, intermedia, exponens,** &c. Biaritz. Pratt Coll.
30189. **N. complanata,** *Lam.* Thick form, near *N. gizehensis.* Biaritz, Bayonne. Pratt Coll.
30190. „ „ Rather thin and flexuous. Biaritz, near Bayonne. Pratt Coll.

* Dr. Phil. De la Harpe has given a careful description of the Nummulites of the Upper Zone of the Biaritz Formation in the 'Bulletin Soc. de Borda à Dax,' iv^e année, 1879.

30187. P 336. P 338. **N. Dufrenoyi,** *d'Arch.* Very large; one 3 inches in diameter and ⅓ inch thick. Biaritz, near Bayonne. Pratt Coll.

N. Dufrenoyi? 1½ inch in diameter. With **Orbitoides** &c. Near Bayonne. Pratt Coll.

30191. P 1157. **Assilina exponens,** var. **granulosa,** *d'Arch.* (septal lines strong and more or less granulate). Biaritz, near Bayonne. Pratt Coll.

P 499. P 501. **Nummulites planulata.** Shown on the weathered surface of grey shelly limestone, with Polyzoa. Biaritz. Pratt Coll.

P 504. **N. planulata** and **Operculina Boissyi,** *d'Arch.* Much flattened, exposed on the weathered bed-plane of grey limestone, with Polyzoa. Biaritz. Pratt Coll.

P 335. **N. planulata.** In friable sandy Nummulitic limestone, or sand with calcareous cement and full of Nummulites.

P 331. **N. Ramondi** (*Defr.*) and its *planulate* form. In grey sandy Nummulitic rock. Bayonne? Marked "Randen Collection."

30184. P 511. **N. Ramondi.** In friable sandy Nummulitic limestone. Biaritz, Bayonne. Pratt Coll.

P 490. **N. Ramondi** (or neat young *N. planulata*), **N. planulata** (or broad old *N. Ramondi*), and **Operculina Boissyi.** In yellowish sandy Nummulitic limestone. Bayonne. Pratt Coll.

P 1159. **N. Ramondi** and **planulata.** As the last, but in a less friable, more compact rock. Biaritz. Presented by Miss Hume.

P 496. P 498. **N. intermedia,** *d'Arch.* Cemented in a mass. Bayonne. Pratt Coll.

P 491. „ „ and a broad flat variety or stage of growth. Massed in sandy limestone. Bayonne. One specimen labelled "Nummulitic bed, bank of River Nive at Bayonne." Pratt Coll.

30182. **N. intermedia,** *d'Arch.* Cemented mass. Biaritz, near Bayonne. Pratt Coll.

30185. P 344. „ „ Biaritz, Bayonne. „

P 340. P 343. „ „ and **Operculina,** *Boissy.* In a friable sandy Nummulitic limestone. Biaritz. Pratt Coll.

P 500. **N. intermedia, Operculina Boissyi,** and **Heterostegina.** In a greenish-grey shelly marl-rock. Marked "Middle Beds, Biaritz." Pratt Coll.

P 337. **N. biaritzensis,** *d'Arch.* &c. Biaritz.

P 342. „ **N. Lucasana** (*Defr.*), **Orbitoides papyracea** (*Boub.*), and **O. aspera?,** *Gümb.* In a rolled piece of Nummulitic limestone. Biaritz?

P 333. **N. garansensis** (?), *d'Arch.* Biaritz. Pratt Coll.

50318. **N. Ramondi** (*Defr.*) and **Operculina ammonea,** *Leym.*, passing into *O. granulosa*, Leym., with **Orbitoides papyracea** (rare) and other small organisms and sand, constituting a friable forami-

niferal rock, in which *N. Ramondi* most, *Operculina* next, and *Orbitoides* least abounds. Marked "*Operculina ammonea*, Leymerie; Mém. Soc. Géol. France, 2e sér. tom. i. pl. 13. f. 11; Suessonien B à Biaritz."

P 334. P 493. **Operculina Boissyi,** *d'Arch.* Biaritz. Pratt Coll.

P 332. **Heterostegina (reticulata,** *Gümbel*?). Biaritz. „

P 494. P 1133. **Orbitoides dispansa** (*Sow.*). In foraminiferous marly and sandy limestone. Biaritz. Pratt Coll.

P 502. P 503. P 1135. **O. papyracea** (*Boub.*) and **O. aspera**?, *Gümbel.* With small Nummulites and other Foraminifera, in a marl-rock (sandy and marly limestone). Biaritz. Pratt Coll.

P 495. **O. papyracea** (large and small), **stellata,** and **Nummulites Ramondi.** In marl-rock (as above). Biaritz. Pratt Coll.

30183. P 492. **O. papyracea, radians,** and **Operculina Boissyi.** Forming a mass with sandy and marly Orbitoidal rock. "Rock 500 feet thick for five miles." "Middle beds." Biaritz, near Bayonne. Pratt Coll.

P 505. **O. papyracea** and **O. stellata.** Sandy and marly Orbitoidal rock. Biaritz. Pratt Coll.

P 497. **O. papyracea** and **O. variecostata,** *Gümbel.* Sandy and marly Orbitoidal rock. Biaritz. Pratt Coll.

P 506. **O. papyracea** and **Operculina Boissyi.** Sandy and marly Orbitoidal rock. Biaritz. Pratt Coll.

P 508. **O. radians.** Nummulites (small) and other Foraminifera, with Polyzoa &c., in a sandy and marly Orbitoidal rock. Biaritz. Pratt Coll.

50317. **Nummulites biaritzensis,** *d'Arch.*, **Orbitoides stellata,** *d'Arch.*, **Orbitoides papyracea,** *Boubée*, and **Orbitoides aspera,** *Gümbel.* In shell-grit limestone. Marked "*Orbitolites stellata*, d'Arch., Mém. Soc. Géol. 2e sér. tom. ii. pl. 7. f. 1; Suessonien à Biaritz."

P 1137. **Orbitoides papyracea** and varieties, with **Nummulites intermedia, N. biaritzensis,** &c. In a weathered block of orbitoidal limestone. Biaritz. Collected by Mr. W. Cookworthy. From the Museum of Practical Geology.

P 509. P 1158. **O. papyracea** &c. Bayonne. Pratt Coll.

P 329. **O. papyracea,** var., and **O. aspera.** Biaritz. „

P 345. P 507. **Orbitoides,** sp.? Biaritz. „

P 510. **O. papyracea** (large). With Orbitoidal limestone. Biaritz. Pratt Coll.

30181. **O. papyracea.** Small and thin (=*S. Prattii*, Michelin). Biaritz, near Bayonne. Pratt Coll.

30186. **O. aspera** (?), *Gümbel.* Biaritz, Bayonne. „

TERTIARY: EOCENE.

SPAIN.

30200. P 908. **Nummulites perforata** (*Montfort*). In grey Nummulitic Limestone *, marked "Upper Beds, Gerona," Catalonia. Pratt Coll.

See S. P. Pratt's paper "On the Geology of Catalonia," Quart. Journ. Geol. Soc. vol. viii. p. 268.

30199. P 908. **N. perforata.** Light grey limestone (weathered rusty) and separate Nummulites. The large specimens are accompanied by small individuals; and these latter have large primordial chambers, as is the case with those associated with *G. gizensis* in Egypt. Pratt Coll.

P 907. **N. perforata.** In Nummulitic Limestone. Catalonia. „

P 906. „ Igualada, at the foot of Montserrat, Spain.

P 905. **N. Ramondi,** *Defrance* (small perforate?). Near Caldas, Spain. T. Rupert Jones Coll.

P 909. **N. biaritzensis,** *d'Arch.* A worn and weathered piece of Nummulitic rock composed of this *Nummulina*. Catalonia? Pratt Coll.

36258. **Orbitoides dispansa.** "Spain?"

P 904. **O. papyracea.** Near Caldas, Catalonia. T. Rupert Jones Coll.

MIOCENE.

MALAGA.

See Prof. D. T. Ansted's memoir in the Quart. Journ. Geol. Soc. vol. xv. 1859, p. 600, and vol. xvi. p. 299. Tejares Clay.

P 892. **Nodosaria raphanus** (*Lin.*) and varr.
„ **N. raphanistrum** (*Lin.*).
P 893. **N. longiscata,** *d'Orb.*
P 894. **Dentalina acicula,** *Lam.*
„ **D. communis,** *d'Orb.*, &c.
P 899. **Frondicularia complanata,** *Defr.*
P 895. P 897. **Cristellaria cultrata** (*Montf.*).
P 897. **C. calcar** (*F. & M.*).
„ **C. cassis** (*F. & M.*).
P 898. **C. ariminensis,** *d'Orb.*
„ **C. echinata,** *d'Orb.*
P 900. **Planorbulina farcta** (*F. & M.*), varr.
„ **Pulvinulina repanda** (*d'Orb.*) and varr.
P 902. P 903. **Discorbina trochidiformis,** varr. &c.

} T. Rupert Jones Coll.

* The cathedral of Gerona is built of this stone.

MALTA.

Foraminiferous Rocks from Malta.

Described in the Geol. Mag. vol. iii. April 1866, pp. 145, 151, &c. See also the 'Geologist,' vol. vii. 1864, pp. 133–135, and Geol. Mag. vol. i. 1864, p. 104. See also Th. Fuchs, "On the Tertiaries of Malta," Proc. Imp. Acad. Vienna, 1876, vol. lxx. p. 92; and Geol. Mag. (n. s.) vol. iv. p. 120.

P 480. No. 1. "Upper Limestone." Friable shell-grit; with **Heterostegina depressa**, *Pecten*, and Polyzoa, mostly as rolled fragments. Collected by A. L. Adams.

P 484. P 475. No. 2 (p. 151). Sandy shell-grit ("sand-bed"); with grains of quartz, lobulated glauconite, &c., and **Heterostegina depressa**, Polyzoa, Echinoderms (fragments), shells, and *Bairdia* (*subdeltoidea*?). Collected by A. L. Adams.

P 485. No. 3 ("No. 2" at p. 152, Geol. Mag.). & "Marl-bed." No. 4 ("No. 3" at p. 152 *op. cit.*). "Calcareous Sandstone." Nodules of iron-pyrites, decomposed, in more or less concentric nodules of iron-oxide and ochre. Collected by A. L. Adams.

P 486. No. 4 ("No. 3" *op. cit.*). "Calcareous Sandstone." This bed contains **Nodosaria raphanistrum, Dentalina communis** (var.), **Cristellaria cultrata, Amphistegina vulgaris, Lituola Soldanii** (coarse, greenish grey, abundant), Polyzoa, *Pecten* and other shells, and Echinoderms. Collected by A. L. Adams.

P 485. No. 4 ("No. 3" *op. cit.*). Nodules from this bed:—two calcareous, greenish-grey hard limestone, one homogeneous, polished, the other coarser, shelly. (In some sections are seen no less than five bands of these nodules, commencing in No. 5 limestone and ending in upper part of No. 4.) Collected by A. L. Adams.

P 479. No. 4 ("No. 3" *op. cit.*). Nodular masses:—honeycombed pieces of hard ferruginous shell-rock, with Polyzoa adherent to the waterworn surface of white limestone of similar materials. With **Orbitoides**, Echinoderms, Polyzoa, and shells. Collected by A. L. Adams.

P 481. P 482. P 483. P 487. No. 5 ("No. 4" *op. cit.*). "Lower Limestone." Shell-grit; with **Heterostegina depressa, Amphistegina vulgaris, Orbitoides Mantelli**, and Polyzoa. Collected by A. L. Adams.

P 312. P 489. No. 5 ("No. 4" *op. cit.*). "Lower Limestone." Shell-grit; with large **Orbitoides**. Collected by A. L. Adams.

P 477. No. 5 ("No. 4" *op. cit.*). *Teredo* (tubes). Abundant in certain parts of the lowermost rocks (especially such portions as are broken up for lime) near Morsa Girocco, which is composed almost entirely of them. Collected by A. L. Adams.

P 476. No. 5 ("No. 4" *op. cit.*). Pisolitic Orbitoidal Limestone. Lowest limestone in Malta. Collected by A. L. Adams.

P 478. Black siliceous limestone; with Echinoderm-ossicles, **Amphistegina**, &c. From the breccia and gravels ("Elephant-bed," "Pleistocene") only. Collected by Capt. F. W. Hutton, 1864.

P 314. Hard Shell-grit Limestone. St. George's Bay, Malta.
Collected by Capt. F. W. Hutton.
Like "No. 5" above. See also *op. cit.* p. 146.

P 487. White Orbitoidal Limestone. Melleha, Malta.

P 311. **Orbitoides Mantelli**; large and flat. A fragment, 2 inches across.
Collected by Capt. F. W. Hutton.

P 313. White Limestone, full of **Heterostegina***. Marsa Scala, Malta. From the upper part of the semicrystalline limestone ("No. 2" of Hutton's grouping; No. I. of Spratt; see 'Geologist,' vol. vii. p. 134), with *Scutella subrotunda*.
Collected by Capt. F. W. Hutton.

P 308. **Cristellaria cassis** (*F. & M.*).

P 310. **Lingulina costata**, *d'O.*

P 309. **Nodosaria raphanus** and **N. raphanistrum** (*Linn.*).
T. Rupert Jones Coll.

34041. **Heterostegina depressa**, *d'Orb.* Malta.
Presented by W. K. Parker, F.R.S.

P 46. ,, ,, ,, In a mass. Malta.
Tennant Coll.

P 64. ,, ,, ,, In a mass. Malta.
From the M. P. G.

P 468. ,, ,, ,, Dingli, Malta. From "Bed B" of Capt. Spratt's paper, "*Heterostegina* Beds" (Capt. Hutton, Geol. Mag. vol. iii. p. 146).

N.E. AFRICA.

EOCENE.

CYRENE.

P 513. **Nummulites perforata.** Marsa Susa, the ancient port of Cyrene. From strata younger than the Nummulitic bed of Crete referred to further on. Collected by Admiral Spratt.

EGYPT.

P 1163. **Nummulites perforata** (*Montf.*); thick. Metaghora, Egypt.
T. Rupert Jones Coll.

11617. **N. complanata**, *Lam.* (= *Camerina nummularia*, Bruguière, 1792; see Ann. & Mag. N. H. Sept. 1861, pp. 234 & 236); with **N. curvispira**, *Meneghini* (small, with large primordial chamber). Egypt. Mantell Coll.

* These flat round Foraminifera were for a long time erroneously referred to as *Lenticulites* and *Operculina complanata*. See 'Geologist,' vol. vii. p. 135.

38560. } **N. complanata**, with **N. curvispira**. Alexandria.
38561. } Presented by Miss E. Warne.

P 1008. „ „ „ Egypt.
Presented by Prof. Owen, F.R.S.

P 1013. „ „ „ and **N. Lucasana**, *Defr.* Cairo, Egypt. Presented by Prof. Owen, F.R.S.

13540. } **N. complanata** and the thick-edged var. **gizensis** (*Forskål*), with
P 884. } **N. curvispira**. "Gebel Mokuttum," Cairo.
Presented by Sir J. G. Wilkinson.

P 1006. **N. complanata**. Great Pyramid, Egypt.
Presented by Mr. Doubleday.

54996. „ (one specimen, 1½ inch in diameter), passing into a smaller form with thin edge. Mokattam Quarries, near Cairo.
Presented by E. T. Rogers, Esq.

P 1016. **N. complanata** (several loose specimens), passing into the thick-edged var. **gizensis**. Egypt.

P 1007. **N. complanata**, small (=thin form of **gizensis**). Egypt.
Presented by J. Ewing, Esq.

40039. **N. gizensis** (*Forskål*), with **N. curvispira**, *Menegh.*, and **N. Beaumonti**, *d'Arch.* (small, with small primordial chamber). In hard, white, Nummulitic limestone, from the Pyramids of Gyzeh. Presented by Staff-Surgeon Smythe.

40040. **N. gizensis** (thick) and **N. Dufrenoyi** (thin). From "the sandstone range near the Wady Majarah."

40234. **N. gizensis** and **N. curvispira**. In a weathered piece of Nummulitic limestone. From Tel-el-Amarna, Middle Egypt.
Presented by the Rev. T. R. Maynard.

P 1012. **N. gizensis**. Egypt.

P 1009. „ Thebes, Egypt.
From the Museum of Practical Geology.

55103. **N. gizensis**. Loose specimens; mostly split.

P 1010. „ Loose specimens; some with matrix and **N. curvispira**, attached; all more or less weathered. Egypt.

P 1014. **N. gizensis** and **N. curvispira** (with variable conditions of granulation). In friable ferruginous Nummulitic limestone (salty).

P 891. **N. gizensis** and **N. curvispira**. In yellowish Nummulitic limestone; easily broken. Presented by Prof. Owen, F.R.S.

38558. **N. gizensis** and **N. curvispira**. In Nummulitic limestone; somewhat weathered. Alexandria. Presented by Miss E. Warne.

P 1015. **N. gizensis** and **N. curvispira**. In white Nummulitic limestone. Egypt.

P 1019. **N. gizensis** and **N. curvispira**. } Beni Hassan, Egypt.
P 1018. „ „ „ ? } Presented by Prof. Owen, F.R.S.

P 1005. „ with **N. curvispira** on one of the specimens. Egypt.

P 1011. **N. gizensis** and **N. curvispira.** Weathered (polished) piece of Nummulitic limestone. Egypt?

P 890. **N. gizensis** and **N. curvispira** (variably granulate). In very hard Nummulitic limestone. Egypt?

P 889. **N. gizensis** and **N. curvispira.** In a much-weathered piece of hard Nummulitic limestone, with fragments of *Pecten* &c. Egypt?

„ **N. gizensis** and **N. curvispira** (slightly or not at all granulated). In a piece of Nummulitic limestone, partly weathered, with fragments of *Pecten*? Egypt?

38559. **N. gizensis** and **N. Ramondi,** *Defr.* (some with large primordial chamber). In brownish Nummulitic limestone. Alexandria. (Some specimens of *N. Ramondi*=*curvispira* without granulation.) Presented by Miss E. Warne.

13578. **N. gizensis** and **N. curvispira.** In cream-coloured Nummulitic limestone. "Red Mountain, near Cairo."
Presented by Sir J. G. Wilkinson.

13587. A polished specimen of the same kind of rock as 13578; from the same locality.

P 888. **Nummulites gizensis, N. curvispira,** and **N. Beaumonti.** (*N. curvispira* here has granules on the septal lines in some cases, between them in others, and with both conditions present in a few; but the granules are chiefly on the septal lines.) One *N. Beaumonti* is visible, near the fish-bone, in this weathered piece of somewhat ferruginous Nummulitic limestone, probably from Egypt.

55102. **N. gizensis, N. curvispira,** and **N. Beaumonti.** The exposed interiors are interesting. Fragment of Nummulitic limestone, with acicular saline efflorescence.

55102. **N. gizensis, N. curvispira** (with variable granulation), and **N. Beaumonti.** The last has the appearance of a young *N. gizensis,* with small primordial chamber and the normally small chambers in the early whorls. Nummulitic limestone. Cairo.

38559. **N. gizensis, N. curvispira,** and **N. Beaumonti** (including some horizontal sections with a small primordial chamber and small early chambers). Easily-broken Nummulitic limestone. Alexandria. Presented by Miss E. Warne.

P 890. **N. gizensis** and thinner var.(?), **N. curvispira,** and some few sections of small **gizensis,** or small **Beaumonti** in flat section, or **Ramondi** (?) in transverse section. Piece of Nummulitic limestone broken off a weathered point. Probably Egypt.
From the Museum of Practical Geology.

38557. **N. Beaumonti.** In white and rather friable Nummulitic limestone. Alexandria. Presented by Miss E. Warne.

55479. **N. Beaumonti?** Few; in a soft, granular, fossiliferous, yellowish limestone. "Moccatam quarries."

P 883. **N. Beaumonti.** Soft whitish Nummulitic limestone. Red Hills, Cairo. Presented by John Milne, F.G.S.

P 640. **N. Beaumonti, N. biaritzensis, N. complanata** (small, or var. *gizensis*), showing passages from one to another. In a very white limestone, with fragments of shells and Echinoderms. Cairo. Presented by John Milne, F.G.S.

P 641. P 642. P 643. P 644. **N. Beaumonti.** With one small **N. complanata,** var., and traces of **Operculina canalifera,** *d'Arch.* Yellowish-white limestone. Cairo. Presented by John Milne, F.G.S.

P 649. **N. Beaumonti** (the smaller) and **N. biaritzensis** (the larger specimen). Loose specimens. Cairo. Presented by John Milne, F.G.S.

P 647. **N. Beaumonti.** Few and obscure; in a very white limestone. Cairo. Presented by John Milne, F.G.S.

55078. **N. Beaumonti?** In a small weathered piece of Nummulitic limestone. Egypt?

P 645. P 646. **Operculina canalifera,** *d'Arch.* With **N. Ramondi?** In white *Operculina*-limestone. Cairo. Presented by John Milne, F.G.S.

P 182. " " In rather hard white *Operculina*-limestone. Probably Egypt.

P 887. " " With **N. Ramondi.** In rather hard *Operculina*-limestone, with *Ostrea* (?) &c. Beni Hassan, Egypt. Presented by Prof. Owen, F.R.S.

CRETE.

EOCENE.

P 515. **Nummulites perforata** (*Montf.*). Small. The gorge of Myrto, Crete; on the south coast, near Franko Kastelli. A. B. Spratt Coll.

54999. **N. perforata** (*Montft.*). Grey Nummulitic limestone. Phalasarna, Crete. Presented by Admiral Spratt, C.B., F.R.S.

P 516. **N. perforata.** Associated with the Hippurite Limestone, and possibly (Admiral Spratt thinks) the upper member of that series. Crete. A. B. Spratt Coll.

MIOCENE.

P 514. **Heterostegina depressa,** *d'Orb.* Cemented in a mass. Collected by Admiral Spratt.

WESTERN ASIA.

EOCENE.

Asia Minor.

P 512. **Nummulites lævigata,** *Lam.* **N. Lucasana,** *Defr.* **N. Ramondi,** *Defr.* In a glauconitic shelly sandstone. Collected by Mr. H. Poole on the south side of the Gulf of Nicomedia. From the Museum of Practical Geology.

P 517. **N. biaritzensis** and **N. complanata** (one). "Asia Minor?"

PALESTINE.

GERIZHEM.

(Collected by the Palestine Exploring Expedition, 1865.)

P 820. **Nummulites Lyelli** and **N. Brongniarti.** In white limestone.

The following is a descriptive note of these and some other specimens collected at the same time, and examined for Sir Henry James by Prof. Rupert Jones. The locality and its geology are of sufficient interest to insert this memorandum.

GERIZHEM. B. Palestine Exploring Expedition, 9/4/65.

A white Foraminiferal limestone, with a few Molluscan shells, fragments of Echinoderms &c., and yielding
Triloculina trigonula,
Quinqueloculina saxorum ?,
Orbitolites complanata,
Alveolina ovoidea (large and small varieties),
Textularia pygmæa,
Nummulites Guettardi ?.

GERIZHEM. C. 9/4/65.

A white Foraminiferal limestone, with fragments of Echinoderms, Crustacea, &c.,
Alveolina ovoidea (long var.),
Nummulites striata.

GERIZHEM. D. 10/4/65.

A cream-coloured Nummulitic limestone, with
Alveolina ovoidea (rare),
Nummulites Lyellii,
—— *Brongniarti*,
—— *Tchichatcheffi* ? vel *Guettardi* ?.

P 755. **N. complanata,** var. **Lyelli.** Dissected by water and showing alar flaps and median chambers. "IX. 10/2/69. J. Boulager."

ARABIA PETRÆA.

EOCENE.

P 518. **Nummulites complanata,** var. **gizensis.** Wady Gharundel, Arabia Petræa.

P 525. **N. perforata.** Hamman Faraoun. See H. Bauerman's memoir, Quart. Journ. Geol. Soc. vol. xxv. p. 24, pl. 1. fig. 2 (map).

P 521. } Specimens of asphaltic Nummulitic limestone, with **N. Ramondi**
P 522*. } and **gizensis.** H. Bauerman and T. R. Jones, *op. cit.* pp. 24 & 38.

P 521. No. 2.
P 523. No. 3. } South of Wady Gharandel.
P 522. No. 4.

P 522*. No. 5. Near Wady Gharandel.

P 524. **N. Ramondi** &c. with crystal of strontian. Behind Cairo. *Op. cit.* pp. 38 & 41.

ITALY.

PLIOCENE.

P 770. **Nodosaria raphanistrum.**
„ **Cristellaria cassis.**
„ **Operculina complanata.**
} Asti, Piedmont, Italy. T. R. Jones Coll.

P 764. **Nodosaria raphanistrum.** Parma.

82174. „ „ " Plioc. sub. Toscano. Peccioli."

55101. **Biloculina simplex,** *d'Orb.*, and other varr. of **B. ringens.** " Plioc. sub. Toscano. Orciano."

55099. **Quinqueloculina Haidingeri,** *d'Orb.*? " Peccioli. Plioc. sub. Toscano."

55101. **Cristellaria cassis** (*F. & M.*). " Plioc. sub. Toscano. Orciano."

55098. **Amphistegina Hauerina,** *d'O.* " Plioc. sub. Toscano. Peccioli."

P 950. **Discorbina rosacea** (*d'Orb.*). Castel Arquato.

6782. **Orbitolites complanata,** *Lam.* Palermo.

P 763. **Operculina complanata** (*Defr.*). Palermo.

P 762.
P 959. } **Cristellaria cassis** (*F. & M.*). Palermo.

P 768. Siliceo-calcareous friable rock, consisting of Diatomaceæ (*Coscinodiscus*), Polycistina, and Foraminifera (**Globigerina, Planorbulina, Virgulina**); with *Clupea tenuissima.* Near Caltanisetta, Sicily. See Ann. & Mag. N. H. ser. 4, vol. ix. p. 228.

MIOCENE.

P 769. **Amphistegina lenticula** (*Defrance*). S. Frediano, near Cosciana, Pisa Hills, Tuscany.

EOCENE.

30196. **Nummulites Puschi?,** *d'A.* In a dark-grey Nummulitic limestone. Nice*. Pratt Coll..

30197. **Assilina mamillata,** *d'Arch.*, thick smooth var. of **A. exponens.** Nice. Pratt Coll.

30194. **Nummulites intermedia,** *d'Arch.* With **Orbitoides.** In marl-rock. Nice. Pratt Coll.

30198. **Orbitoides papyracea.** Small and thin. Nice. „

30193.
P 761. } **Nummulites perforata,** var. **obtusa.** Some specimens cut and polished. Mentone, near Nice. Pratt Coll.

* The Nummulites of the Nice district have been specially studied by Dr. Phil. de la Harpe; and in his account of them he has offered some very useful suggestions as to the classification of Nummulites. See Bull. Soc. Géol. France, 3e sér. vol. v. pp. 817 &c. (1879), and Bull. Soc. Vaud. Sc. Nat. vol. xvi. p. 201 &c. (1879).

P 772. **N. striata** (?), a few **Orbitoides**, and **Alveolina** (rare). In a fragment of weathered dark-grey Nummulitic limestone. From Mosciano.

From the Museum of Practical Geology. Collected by J. B. Pentland.

A section of the Nummulitic strata of *Mosciano*, near Florence, is given and described by Murchison, Quart. Journ. Geol. Soc. vol. v. p. 278. The specimen probably came from this place.

ITALY AND THE TYROL.

42855. **Nummulites biaritzensis**, *d'Arch.* "Breccia nummulitica di Centemero." Nummulitic limestone (mass of Nummulites), with fragments of limestone, quartz pebbles, &c.

42854. **Nummulites biaritzensis, Orbitoides stellata**, and other small organisms in sandy shell-grit. "Calcare nummulitico di Centemero."

31159. **N. perforata.** Large and thick. Marked "*Nummulites nummiformis.* Monte Resizze." P. Mohr Coll.

P 766. **Nummulites** (small), **Alveolina**, and other small organisms in a silicified rock (once a Nummulitic limestone). "Lapis frumentarius." Verona, North Italy. See the 'Geologist,' vol. vi. 1863, p. 312, where the old authors (Mercatus and Langius), treating of "Lapis frumentarius" &c. are quoted in full.
T. Rupert Jones Coll.

P 767. **N. striata?** Cut and polished piece of Nummulitic limestone.

P 765. **Orbitoides** and **Nummulites.** Very obscure. Cut and polished piece of silicified Orbitoidal (?) rock.

34037. **N. complanata** and **N. Lucasana.** In a weathered piece of Nummulitic limestone. Monte Valdo, near Verona.

P 721. **Assilina exponens.** „ „

P 722. **Nummulites perforata.** Thick. Monte Valdo, Tyrol, near Verona.

A. Thick (worn on one face), with scarcely any column-spots or scabrous granulation.

B. Rather thicker, with the alar flaps elongate, as in some forms of *N. biaritzensis*, *N. Beaumonti*, and *N. obesa.*

P 722. **N. perforata.** Thin. Monte Valdo, near Verona, Tyrol.

C. Thin, flat, smooth.

D. Rather thinner, much marked with column-spots.

E. Intermediate to C and D.

P 1139. A partly polished pebble of dark-grey Orbitoidal limestone. "Ex Sila fluvio." ? The River Sile, running by Treviso towards Venice. North-eastern Italy.

CARINTHIA.

EOCENE.

P 779. **Nummulites biaritzensis,** *d'Arch.* Sonnenberg, near Althofen, Carinthia. Klipstein Coll.

P 777. **N. Lucasana,** *Defr.*
„ **N. striata,** *d'Orb.*
„ **Orbitoides papyracea** (*Boubée*). } Sonnenberg, Carinthia. Klipstein Coll.

TERTIARY: MIOCENE.

AUSTRIA.

Vienna.

P 346–P 474. A series of small glass tubes containing fossil Foraminifera from the Miocene strata of Nussdorf and Baden, near Vienna.

The old MS. list* is dated 1845; and Privy-Councillor Baron von Hauer states, in the preliminary letter, that, unwilling to wait longer, he sends off the specimens with such names as have been provisionally given to them [by A. d'Orbigny]; and he regrets that the descriptions have not yet been published. The collection came to the British Museum by purchase from Dr. Brackmann.

The names applied in the following list are founded on the modern nomenclature of Foraminifera. See, for instance, as regards the *Rotalina*, Quart. Journ. Geol. Soc. vol. xxviii. May 1872, p. 103, &c.

(1) **Polystomella crispa** (*Linn.*). Nussdorf.
(2) **Quinqueloculina** (near **Boueana,** *d'O.*). With delicate striæ. N.
(3) **Truncatulina** (**Anomalina**) **variolata,** *d'O.* N.
(4) **Polystomella crispa** (*Linn.*), var. N.
(5) „ **regina,** *d'O.* N.
(6) „ **crispa** (*Linn.*), var. **macella** (*F. & M.*). N.
(7) **Cristellaria cultrata** (*Montf.*). N.
(8) **Polymorphina spinosa,** *d'O.* N.
(9) „ **digitalis,** ? *d'O.* Finely striate. N.
(10) **Nonionina granosa,** *d'O.* N.
(12) **Planorbulina Haidingeri,** *d'O.* With one **Polystomella crispa.** N.
(13) **Amphistegina mammillata,** *d'O.* N.
(14), (14 *bis*) **Planorbulina Akneriana,** *d'O.* N.
(15) **Polymorphina complanata.** N.?
(16) **Polystomella Josephina,** *d'O.* N.

* The pencil-marks on the old MS. catalogue mean:—
√, that the name is mentioned in d'Orbigny's For. Foss. Vien. 1846;
×, that the contents of the tube have been examined.

(17) **Planorbulina Kalembergensis ?** (*Rss.*). N.
(18) **Truncatulina lobatula** (*W. & J.*). N.
(19) **Polymorphina communis,** *d'O.* N.
(21) **Nonionina.** Decomposed. N.
(22) **Amphistegina Hauerina,** *d'O.* N.
(23) **Nonionina communis,** *d'O.* Complanate variety. N.
(25) **Planorbulina (Anomalina) ammonoides** (*Rss.*). N.
(26) **Textularia carinata,** *d'O.* N.
(27) **Triloculina gibba,** *d'O.* N.
(28) **Alveolina melo** (*F. & M.*). N.
(29) **Dentalina communis,** *d'O.*, var. **elegans,** *d'O.* N.
(30) **Biloculina simplex,** *d'O.* N.
(31) **Dentalina communis,** var. **elegans,** *d'O.* Small, with deep septal lines. N.
(32) **Biloculina lunula,** *d'O.*, small. **B. affinis,** *d'O.*, &c. N.
(33) **Quinqueloculina Juleana,** *d'O.* N.
(34) **Planorbulina (Anomalina) Badenensis,** *d'O.* N.
(35) **Discorbina obtusa,** *d'O.* N.
(36) **Polystomella crispa** (*Linn.*), var. N.
(37) **Amphistegina Hauerina,** *d'O.* Young. N.
(38) **Quinqueloculina Hauerina,** *d'O.* N.
(39) **Sphæroidina Austriaca,** *d'O.* No loc.
(40) **Quinqueloculina Akneriana,** *d'O.* N.
(41) **Polymorphina problema,** *d'O.* N.
(42) **Spiroloculina dilatata,** *d'O.*, and an arenaceous **Spiroloculina.** N.
(43) **Marginulina simplex,** *d'O.* N.
(44) **Triloculina inflata,** *d'O.* N.
(45) **Quinqueloculina.** Decomposed. N.
(46) **Bulimina ovata,** *d'O.* N.
(47) **Polymorphina communis,** *d'O.*, and var. N.
(48) **Amphistegina Hauerina,** *d'O.* With little central mamilla. N.
(49) **Polystomella crispa** (*Linn.*), var. N.
(50) **Truncatulina lobatula** (*W. & J.*). N.
(51) **Polymorphina communis,** *d'O.*, **gibba,** *d'O.*, &c. N.?
(52) ,, **gibba,** *d'O.* N.

(53) **Calcarina aculeata**, *d'O.* N.

(54) **Truncatulina lobatula** (*W. & J.*). N.

(55) **Planorbulina Kahlembergensis** (*Rss.*). N.

(56) **Heterostegina costata**, *d'O.* N.

(57) **Nonionina granosa**, *d'O.*, var. N.

(58) **Pullenia bulloides**, *d'O.* N.

(60) **Textularia Haueri**, *d'O.* N.

(61) **Planorbulina Akneriana** (*d'O.*). Baden.

(62) **Polystomella.** Partly decomposed. N.?

(63) **Planorbulina Akneriana** (*d'O.*), var. N.

(63 *bis*) **Bulimina pupoides**, *d'O.*, **pyrula**, *d'O.*, &c. Many. Loc.?

(64) **Miliola (Adelosina) pulchella**, *d'O.* N.

(65) **Rotalia Beccarii** (*Linn.*). N.

(66) **Quinqueloculina Schreibersii**, *d'O.*, and **Q. Josephina**, *d'O.* N.

(67) **Planorbulina Haidingerii** (*d'O.*), var. N.

(68) **Quinqueloculina triangularis**, *d'O.*, &c. N.

(69) **Miliola (Adelosina) lævigata**, *d'O.* N.

(70) **Uvigerina pygmæa**, *d'O.* N.

(71) **Globigerina bulloides**, *d'O.* N.

(72) **Rotalia Soldanii**, *d'O.* N.

(73) **Glandulina ovula**, *d'O.* N. and B.

(75) **Textularia sagittula**, *Defr.*, var. **articulata**, *d'O.* N.

(76) **Pulvinulina Brongniartii**, *d'O.* N.

(78) **Triloculina consobrina**, *d'O.* N.

(79) **Textularia deperdita**, *d'O.* N.

(80) **Quinqueloculina Rodolphina**, *d'O.* B.

(81) **Nonionina communis**, *d'O.* N.

(82) **Truncatulina lobatula** (*W. & J.*); **Planorbulina Haidingeri** and one **Polystomella crispa**; and pieces of broken tube. Loc.?

(83) **Nonionina umbilicata** (*Montagu*). N.

(84) **Bulimina pupoides?**, *d'O.* N.

(85) **Pulvinulina punctulata** (*d'O.*). Near **P. Menardi** (*d'O.*). N.

(86) **Quinqueloculina Haidingeri**, *d'O.* B.

(87) ,, **Schreibersii**, *d'O.* B.

(88) **Cristellaria cultrata** (*Montf.*). B.
(89) **Lingulina costata**, *d'O.* B.
(90) **Dentalina communis**, varr. **inornata** et **elegans**, *d'O.* B.
(91) **Nodosaria raphanistrum** (*Linn.*). B.
(93) **Discorbina Parisiensis** (*d'O.*). Loc.?
(94) **Verneuilina (Clavulina) communis** (*d'O.*). N. and B.
(95) **Biloculina lunula**, *d'O.* B.
(96) **Dentalina communis**, var. **Boueana**, *d'O.* B.
(97) **Biloculina contraria**, *d'O.* B.
(98) **Pulvinulina Haueri**, *d'O.* N.
(99) **Textularia Mayeriana**, *d'O.* B.
(100) **Pulvinulina Partschiana** (*d'O.*). B.
(101) **Dentalina elegantissima** et **acuta**, *d'O.* B.?
(102) **Nodosaria hispida**, *d'O.* B.
(103) **Orbulina universa**, *d'O.* B.
(105) **Quinqueloculina triangularis**, *d'O.*, &c. B.
(106) **Textularia Mayeriana**, *d'O.* B.
(107) **Dentalina guttifera**, *d'O.* B.
(109) **Vaginulina Badenensis**, *d'O.* B.
(112) **Bolivina antiqua**, *d'O.* B.
(113) **Dentalina communis**, varr. **Adolphina**, **elegantissima**, et **guttifera**, *d'O.* B.?
(114) **Spiroloculina excavata**, *d'O.* B.
(115) **Bulimina pyrula**, *d'O.* N.
(116) **Nodosaria radicula** (*Linn.*). B.
(117) **Dentalina communis**, varr. **elegantissima** et **spinosa**, *d'O.* B.
(118) **Cristellaria ariminensis**, *d'O.* B.
(119) **Lingulina rotundata**, *d'O.* B.
(120) **Cristellaria vortex** (*F. & M.*) et **cultrata** (*Mtf.*). B ?
(121) **Quinqueloculina Buchiana**, *d'O.* B.
(123) **Dentalina communis** et varr. **elegans**, **pauperata**, *d'O.*, &c. B.?
(124) **Cristellaria echinata**, *d'O.*, et **calcar** (*Linn.*). B.
(125) ,, **semiluna**, *d'O.* B.
(127) **Cristellaria cultrata** (*Montf.*). B.
(128) **Planorbulina (Anomalina) rotula**, *d'O.* B.

(129) **Polymorphina gibba**, *d'O.* B.

(130) **Nodosaria Mariæ**, *d'O.* B.

(131) **Biloculina affinis**, *d'O.* B.

(133) **Lituola agglutinans** (*d'O.*). Spiral portion. B.

(134) **Dentalina communis**, var. **elegans**, *d'O.* B.

(135) **Cristellaria cultrata** (*Montf.*). One passing into **Cr. calcar** (*Linn.*). B.

(136) **Cristellaria Haueriana**, *d'O.* B.

(137) **Trochammina incerta** (*d'O.*). B.

(139) **Cristellaria calcar** (*Linn.*). B.

(140) „ **cassis** (*F. & M.*). B.

(141) **Dentalina communis**, var. near **elegans**, *d'O.* B.

(143) **Nummulina striata**, *d'O.* N.

The names given in the MS. list were provisionally applied before the publication of the 'Foraminifères Fossiles du Bassin de Vienne' (1846). They often indicate the direction of d'Orbigny's first thoughts as to the possible alliances, determined more correctly afterwards.

P 354. P 355.	**Amphistegina Haueri**, *d'O.*	Vienna.			P. Mohr Coll.
P 328.	„	„	„	„	Bruckmann Coll.
36256. 36257.	„	„	„	Large and small. Presented by W. K. Parker, F.R.S.	Nussdorf, Vienna.
P 326. P 327.	**Amphistegina**-marl.	Nussdorf, near Vienna.			Krantz.

HUNGARY (Western Carpathians).

14348. **Nummulites Puschi**, *d'Arch.*, with **N. striata**, *d'O.* In dark-grey Nummulitic limestone. Zagopane, Tatra, Hungary. Krantz.

P 780. **N. Puschi**, *d'A.* Zagopane.

P 774. **N. Puschi** and **N. striata.** In grey Nummulitic limestone. Zagopane, Carpathians. Murchison Coll.

See Quart. Journ. Geol. Soc. vol. v. p. 259.

P 775. **N. Puschi.** In dark-grey Nummulitic limestone. Zagopane. Murchison Coll.

P 776. **N. Puschi, N. striata,** and **N. perforata.** In dark-grey Nummulitic limestone. Zagopane. Murchison Coll.

„ **N. perforata.** Numerous, both large and small. With **N. striata** and **N. Puschi.** In dark-grey Nummulitic limestone. Zagopane. Murchison Coll.

P 773. **N. perforata** and **N. striata.** In grey Nummulitic limestone, with *Dentalium.* Zagopane. Murchison Coll.

P 778. **N. perforata.** Puszta-Inota (Hungary?). T. Rupert Jones Coll.

TERTIARY: EOCENE.

HUNGARY.

Eocene Nummulites from the plain between Buda and Tata, in Hungary. Collected, prepared, and presented by Herr Max von Hantken and Herr S. E. de Madarász, through Herr Ferd. Bárány, Inspector-General of the Imp. Roy. Austrian and Roy. Hungarian Department of the International Exhibition of London in 1871.

55002. 55003.	**Nummulites Tchihatcheffi**, *d'Arch.*		Bajna,	Hungary.
55004. 55005. 55006.	„	„ „	Mogyros,	„
55007. 55008.	„	**intermedia**, *d'Arch.*	Kovácsi,	„
55009.	„	**Ramondi**, *Defr.*	Dorog,	„
55010.	„	**garansensis**, *Joly & Leym.*	Kovácsi,	„
55011. 55012.	„	„ „	Solmar,	„
55013.	„	**Lucasana**, *Defr.*	Kis Gyon,	„
55014.	„	„ „	Szapár,	„
55015.	„	„ „	Zircz,	„
55016.	„	„ „	Dorog,	„
55017.	„	„ „	Tokod,	„
55018.	„	„ „	Kovácsi,	„
55019.	„	„ „	Mogyros,	„
55020. 55021.	„	„ „	....	„
55022.	„	**Ramondi**, *Defr.*	Bajoth,	„
55023.	„	**striata**, *d'Orb.*	....	„
55024.	„	**intermedia**, *d'Arch.*	....	„
55025.	„	**Ramondi**, *Defr.*	Piszke,	„
55026.	„	„ „	....	„
55027. 55028.	„	**striata**, *d'Orb.*	Tokod,	„
55029.	„	„ „ var.	Mogyros,	„
55030.	„	„ „ „	Bajoth,	„
55031.	„	„ „ „	Dorog,	„
55032.	„	„ „ „	Piszke,	„
55033.	„	„ „ „	Bajoth,	„
55034. 55035.	„	„ „ „	Piszke,	„

55036. 55037. 55038.	**Nummulites striata**, *d'Orb.*, var.	Kovácsi,	Hungary.
55039.	„ „ „ „	Solmar,	„
55040.	„ **placentula**, *Desh.*	....	„
55041.	„ **striata**, *d'Orb.*	....	„
55042.	„ **subplanulata**, sp. nov., *nobis.*	Dorog,	„
55043. 55044.	„ **Kovacsiensis**, „ „	Kovácsi,	„
55045. 55046.	„ „ „ „	Tokod,	„
55047. 55048.	„ „ „ „	....	„
55049.	„ **placentula**, *Desh.*	Piszke,	„
55050.	„ „ „	....	„
55051.	„ **Ramondi**, *Defr.*	....	„
55052.	„ **perforata** (*Montf.*).	....	„
55053.	„ **complanata**, *Lamarck.*	Bakony,	„
55054.	„ (**Assilina**) **spira**, *Roissy.*	Ajka,	„
55055.	„ „ **granulosa**, *d'Arch.*	„	„

TRANSYLVANIA AND BULGARIA.

Transylvania.

P 781. P 782. **Nummulina complanata.** Large and small. Transylvania. T. Rupert Jones Coll.

Bulgaria.

P 275. **Operculina canalifera**, *d'Arch.*
P 274. **Orbitoides Fortisii.**
P 273. Foraminiferous sand.
Eocene. Varna, Bulgaria. T. Rupert Jones Coll. See Quart. Journ. Geol. Soc. vol. xii. p. 387, and vol. xiii. pp. 73, 82.

34039. **Orbitoides papyracea**, var. **Fortisii.** Rugose. Varna, Bulgaria. Presented by W. K. Parker, F.R.S.

34040. **Operculina canalifera**, *d'Arch.* Varna, Bulgaria. Presented by W. K. Parker, F.R.S.

P 269. P 272. **Nummulites distans** (*Desh.*). Both large and young. Varna, Bulgaria.

34038. „ „ „ Varna, Bulgaria. Presented by W. K. Parker, F.R.S.

Bulgaria. **Miocene ?**

P 270. **Polystomella crispa.**
„ „ **aculeata.**
„ „ **regina.**
Baljik, Bulgaria. T. Rupert Jones Coll. See Quart. Journ. Geol. Soc. vol. xiii. pp. 77, 78, and vol. xvi. p. 301.

CRIMEA.

EOCENE.

55084. **Nummulites distans**, *Deshayes*. Simferopol. In a white limestone, with some *small* (large-centred) *Nummulinæ*, one of which has the angular straggling septa of *distans*, one has slightly curved septa, and a small one (with a small central chamber) has falcate septa. The alar flapping is very delicate and winding. C. F. Pech Coll.

P 263. **N. distans**, *Deshayes*. Small, with large primary chamber. Simferopol.
N. Ramondi (*Defr.*). In white Nummulitic limestone. Simferopol.
Presented by the Imperial School of Mines of St. Petersburg to the Museum of Practical Geology.

P 266. **N. distans**. A small fragment of white Nummulitic limestone. No mark, except a label referring to Parkinson, 'Org. Rem.' vol. iii. pl. 10. fig. 14, which is *N. lævigata*, and is so termed by Parkinson at p. 152, *op. cit.* Probably from the Crimea.

P 264. **N. distans**, Desh., and small individuals of the same species, with a large primary chamber; also **N. Ramondi** with **biaritzensis** (or its larger form or *vice versâ*). White limestone, weathering somewhat rusty. Simferopol, Crimea.
Presented to the Geol. Surv. Museum by the Imp. School of Mines, St. Petersburg.

P 2. **N. distans?** and **N. Ramondi?** In white Nummulitic limestone. Simferopol. From the M. P. G.

P 265. **N. distans?** (probably). "Close to road, Inkerman (British side)." From the M. P. G.

P 268. **N. rotularius**, *Desh.* (=*Ramondi*, Def.). Cape St. Baroum, Crimea.

Pliocene? or Quaternary.

P 267. **Polystomella crispa** (*Linn.*). In a piece of coarse shell-rock. Crimea.

WESTERN ASIA.

Turco-Persian Frontier.

TERTIARY: EOCENE.

W. K. Loftus's Collection. (Quart. Journ. Geol. Soc. vol. xi. p. 270, &c.)

P 167. **Alveolina subpyrenaica.** Kirrind.
P 180. „ „ Many loose. Kirrind.
P 170. „ „ With an Echinoderm. No special locality.
P 155–P 166. **Orbitoides dispansa** (*Sow.*). Near Kirrind.
O. papyracea? (*Boubée*). „ „

P 155–P 166. **Assilina obesa** (?), *Carter*.
Alveolina subpyrenaica, *Leym.*
Nummulites biaritzensis, *d'Arch.*
Operculina ammonea, *Leym.*, and **O. granulosa**, *Leym.*
Dark grey Nummulitic limestone, yellowish externally, made up largely of the *Assilina* and *Orbitoides*, with Gasteropoda, *Pecten*, Polyzoa, &c. Near Kirrind; some from "Bed No. 6."

P 175. **Orbitoides dispansa** and **O. papyracea?** No special loc. (Mungerrah or Kirrind).

P 171. P 172. P 173. **Assilina exponens** (*Sow.*) **Num. perforata** (*Montf.*), small. Mungerrah, near Dizfúl.

P. 169. **Assilina exponens.** **Num. biaritzensis.** **Operculina.** In a waterworn pebble of *Assilina*-limestone from Mungerrah.

34042. **Assilina exponens.** In a mass of *Assilina*-limestone. Mungerrah.

35284. **A. Leymeriei**, *d'A.*, and a small Nummulite, in a broken boulder of brown Nummulitic limestone. Mungerrah.

Some of the blocks from the Gorge. See Qu. Journ. Geol. Soc. vol. xi. p. 273.

P 183. **Num. biaritzensis** (of large growth). "Zágros Limestone, Kirrind."

P 181. **N. biaritzensis.** Many loose. Kirrind.
See Quart. Journ. Geol. Soc. xi. p. 275.

P 153. **N. perforata** (**obtusa**, *Sow.*). Kirrind.

P 179. **N. perforata**, passing into **N. Bellardii.** Núah Kúh (Núah Range), near Kirrind, on the Turco-Persian frontier (Q. J. G. S. ix. p. 275).

P 174. P 182. **N. perforata** (including **obtusa**). "Nuwa Kúh, Kirrind, Persia."

P 154. P 168. **Orbitoides Mantelli**, with **Alveolina subpyrenaica** and a small Nummulite; in grey compact limestone, or Orbitoidal Marble. Bed No. 7, Mungerrah.
Quart. Journ. Geol. Soc. xi. p. 273.

P 177. P 178. **Loftusia persica**, *H. B. Brady*. Kellapstún Pass, Du Púlún, Bákhtiyári Mountains, Persia.
See Phil. Trans. for 1869, pp. 739–754, pls. 71–80.
Several specimens and 2 microscopic slides.

P 176. **N. perforata.** Kharput, in Turkish Armenia.

To give these interesting and rare specimens from Persia and Turkey their full value as geological evidences, collected by an enthusiastic and enlightened traveller (unfortunately lost to science and his friends in the prime of life), we here add some particulars, from Mr. Loftus's memoir, and from notes on the specimens, as to the distribution of Foraminifera in the Nummulitic rocks of the Zágros, *op. cit.* p. 270 &c.

1. *Mungerrah (N.W. of Dizfúl) in the Lúrish Mountains (Lúristán).*

No. "7," bed 3 *d*, pp. 273, 274.

Assilina exponens.
Orbitoides dispansa.
O. Mantelli.
Alveolina subpyrenaica.
Echinoderm fragments.

No. "8." Nummulites, &c. present in blocks in the Gorge.

N. perforata.
Assilina exponens.
Alveolina subpyrenaica = "Rice-stone" = "Sangí Berinj."

2. *Núah Kúh, the S.W. edge of the trough of Kirrind.*

N. perforata (abundant), and a breccia of the same, p. 275.
" " passing into *N. Bellardii*, d'Arch., one specimen.

3. *From near Kirrind*, brought by the natives (p. 275).

N. biaritzensis, d'Arch.

4. *Between Kirrind and Máhídesht.*

No. "6," bed 3 *f*.

Alveolina subpyrenaica, in yellow calcareous marl.

5. *No.* "6" *of the* "*Kirrind Limestone.*"

Nummulites biaritzensis.
Alveolina subpyrenaica.
Orbitoides dispansa.
Operculina granulosa and *ammonea.* See p. 277.

6. *Alveolina subpyrenaica* is frequent along *the Frontier* (p. 278), with or without Nummulites.

7. *Ban Zárdáh, Dáldhú* (p. 278).

Nummulites and *Alveolina.*

8. *Bámú Range, N.W. of Zohák.*

N. complanata.
Nummulites and *Operculina.*
Alveolina in marl.

9. *Bizendn Range, N.E. of Bámú Range.*

Orbitoides dispansa.

10. *Bákhtiyárí Mountains.*

Loftusia persica.

TERTIARY.

INDIA (WESTERN).

KANDEISH.

48897. **Nummulites biaritzensis.** In a brown sandy limestone, with Corals. Raj-pipla Hills, in Western India (Kandeish), south of

the Nerbudda river, shortly before it enters the Gulf of Cambay. Presented by Alex. Roger, Esq.

See Mr. Roger's paper on this district in the Quart. Journ. Geol. Soc. vol. xxvi. p. 118 &c.

48897. **Orbitoides Fortisii,** *d'Arch.* In brown Orbitoidal limestone. Raj-pipla Hills. Presented by Alex. Roger, Esq.

P 548. **Nummulites biaritzensis,** *d'Arch.* Goojerat, Western India. Presented by Alex. Roger, Esq.

P 539. **Orbitoides dispansa,** *Sow.* Goojerat, Western India.

Cutch, Scinde, and Beloochistan.

46225. **Assilina (Nummulites) exponens,** *Sow.* Young. Cutch (Kachh). Capt. Grant Coll.

This is probably a figured specimen of "*N. acuta,*" pl. 24. f. 13 (in part), Trans. Geol. Soc. London, 2nd ser. vol. v.

46224. **Nummulites acuta,** *Sow.* Cutch. Capt. Grant Coll.

This is a figured specimen, Trans. Geol. Soc. 2nd ser. vol. v. pl. 24. f. 13 (part).

46223. **Nummulites perforata** (*De Montfort*), var. **obtusa,** *Sow.* Cutch. Capt. Grant Coll.

The figured specimen, Trans. Geol. Soc. 2nd ser. vol. v. pl. 24. f. 14 (upper fig.).

46227. **Orbitoides epipphium,** *Sow.* Cutch. Capt. Grant Coll.

The figured specimen, Trans. Geol. Soc. 2nd ser. vol. v. pl. 24. f. 15 (not 15 *a*, 15 *b*).

P 544. **Nummulites obtusa,** *Sow.* Cutch. Murchison Coll.

23283. **Assilina exponens,** *Sow.* (waterworn). Kurrachee (Karachi), Scinde. Major W. E. Baker Coll.

„ **Nummulites perforata** (*de M.*). Globose var.; further rounded by water-action. Kurrachee, Scinde. Major W. E. Baker Coll.

„ **N. complanata,** *Lam.* Kurrachee, Scinde. Major W. E. Baker Coll.

„ A rolled piece of Orbitoidal limestone. Kurrachee, Scinde. Major W. E. Baker Coll.

P 561. **Alveolina ovoidea,** *d'Orb.* Large, elliptical. Luckput Bunder, North Cutch.

P 1160. Nummulitic and Orbitoidal limestones. Scinde? From the India Museum. About 40 rolled pieces, partly cut and polished, and showing **Nummulites obtusa, N. biaritzensis,** &c., **Orbitoides dispansa, O. ephippium,** &c., and in some cases **Alveolinæ.**

P 547. **Nummulites biaritzensis,** *d'Arch.* Scinde.

P. 39. „ „ „ In a rough pebble of Nummulitic limestone. India. From the India Museum.

P 563. **Nummulites** and **Orbitoides.** Constituting a yellowish Nummulitic limestone. Obscure; very much mineralized. India? From the Museum of Practical Geology.

P 1136. **N. obtusa,** *Sow.* In a block of Nummulitic limestone. Scinde? From the India Museum.

P 546. **Orbitoides dispansa,** *Sow.*

30201. **O. Fortisii,** *d'Arch.*, and **O. ephippium,** *Sow.* Hyderabad, Scinde. Duncan Pratt Coll.

30202. **Alveolina melo** (*F. & M.*). Small subspherical form, in a pebble of white *Alveolina*-limestone, cut and polished. India. Duncan Pratt Coll.

P 570. **A. melonoides** (*de Montfort*). Small, prolato-sphæroidal. In white *Alveolina*-limestone. "Near Hyderabad." With an outline of flat-topped hills on the label.

„ **A. melonoides** (*de M.*). With a rather large **Patellina (Cyclolina)?** "Near Hyderabad (north), Indus river."

P 565. **Alveolina,** small, in *Alveolina*-limestone. Near Hyderabad, Scinde.

P 566. **A. ovoidea,** *d'Orb.* Subfusiform: and a Nummulite; in a white *Alveolina*-limestone.

P 550. **A. melonoides** (*de M.*). Prolate-spheroid. In white *Alveolina*-limestone. Scinde? From the India Museum.

P 528. } **Alveolinæ** (**A. melonoides,** *de M.*). Short, fusiform. Four
P 529. } sections on glass. Scinde?

P. 38. **Alveolina ovoidea,** *d'Orb.*, with **Miliola,** small Nummulite, &c. In a polished slice of limestone. Scinde?

P 1134. **Assilina exponens.** In an Assilinal rock. Hala range, Scinde. Murchison Coll. (The Hala Range extends for 180 miles west of the Indus.)

The accompanying label indicates that this was the only specimen from the Hala Range which Sir Roderick Murchison sent to M. d'Archiac for examination.

P 549. **Alveolina melonoides** (*de Montfort*). Prolato-spheroidal. In hard, cream-coloured limestone. South Lukki ("Luckie"), on the Indus, near to and south of Sehwan.

P 562. **A. ovoidea,** *d'Orb.* Short, elliptical. Beloochistan.

23284. **Assilina (Nummulites) exponens,** *Sow.* Large, smooth, subundulate; septal lines very feeble. Alore Hills*, Upper Scinde. Major W. E. Baker Coll.

„ **A. exponens,** *Sow.*, var. **granulosa** (*d'Arch.*). Septal lines raised†, and granules between the septal lines. Alore Hills, Upper Scinde. Major W. E. Baker Coll.

„ **A. exponens,** *Sow.*, and var. **granulosa,** *d'Arch.* 1. Smooth, flat; septal lines feeble. 2. Worn down by solution of substance in water. 3. Small; septal lines stronger; no intermediate granules. Alore Hills, Upper Scinde. Major W. E. Baker Coll.

* The "Alore Hills" appear to be the hilly country ("Kohistan") ranging for about 30 miles south of Roree-Bukkur. Alore or Alor (written "Arore" in the "Indian Atlas," Ordnance Survey, 1878, N.W. Quarter-sheet of Sheet 9) is an old place in ruins, E. by S. of Roree, on the Eastern Nara, an old branch of the Indus.

† In one specimen the septal lines on the outer whorls are feeble or have been reduced by solution.

23284. **Nummulites complanata**, var. **gizensis**, *Forskål.* Alore Hills, Upper Scinde. Major W. E. Baker Coll.

„ **N. complanata**, *Lam.* Alore Hills, Upper Scinde. Major W. E. Baker Coll.

„ „ „ „ thin var. (=*d'A. & H.* t. 1, f. 3.) Alore Hills, Upper Scinde. Major W. E. Baker Coll.

„ **N. perforata** (*de M.*), var. **obtusa**, *Sow.* Alore Hills, Scinde. Major W. E. Baker Coll.

23283. „ „ „ var. C. **déprimée**, *d'Archiac & Haime*, Foss. de l'Inde, p. 115, t. 6. f. 12. Probably Scinde. Major W. E. Baker Coll. ?

23284. **N. perforata** (*de Montfort*), var. C. **déprimée**, *d'A. & H.* Alore Hills, Upper Scinde. Major W. E. Baker Coll.

„ **N. perforata** (*de M.*), var. **obtusa**, *Sow.* Alore Hills, Upper Scinde. Major W. E. Baker Coll.

„ **N. perforata** (*de M.*), var. **gizensis**, *Forskål.* Alore Hills, Upper Scinde. Major W. E. Baker Coll.

„ **N. perforata** (*de M.*), var. **gizensis**. Alore Hills, Upper Scinde. Major W. E. Baker Coll.

„ **Orbitoides Fortisii**, *d'Arch.* Alore Hills, Upper Scinde. Major W. E. Baker Coll.

P 557. **Nummulites** (obscure). In a white Nummulitic limestone. "Bukkur*. Dec. /40."

P 557*a*. **Nummulites**, near **biaritzensis** (?). In a white Nummulitic limestone. "Bukkur, near the river. Dec. 18th/40."

P 551. **N. biaritzensis.** In a yellowish Nummulitic limestone. "Bukkur."

P 556. Nummulitic limestone, containing some varieties of **N. complanata**? Bukkur. [Compare Nummulitic rock from Sukkur.]

P 559. Nummulitic rock, with a Nummulite (near **N. obesa**, d'A. & H., pl. 8. f. 7). A "striate" form, varying from bi-convex to flat. Sukkur or Sukhur, on the Indus.

P 556. **Nummulites biaritzensis, Assilina exponens**, and **Orbitoides.** In a yellowish Nummulitic limestone. "Sukkur†, extreme west."

P 558. **Alveolina**; small; in *Alveolina*-rock. Sukkur.

P 571. } **Nummulites complanata**, *Lam.* Scinde.
P 586. }

P 575. **N. perforata** (*de Montf.*) and **obtusa**, *Sow.* Scinde.

P 576. **N. biaritzensis**, *d'Arch.* Scinde.

P 578. „ ?

* Bukkur or Bukhur is a rock island and fort of Scinde, in the Indus, between the towns of Roree on the E. and Sukkur on the W. bank, 165 miles N.N.E. of Hyderabad.

† On the west bank of the Indus.

P 577. **N. Lucasana,** *Defr.* Scinde.
P 579. **N. Beaumonti,** *d'Arch.* Scinde.
P 588. **N. Ramondi,** *Defr.* Scinde.
P 573. **N. sublævigata,** *d'Arch.* Scinde.
P 587. **N. garansensis,** *d'Arch.* Scinde.
P 547. P 582. } **Assilina exponens** (*Sow.*) and **N. perforata.** Scinde.
P 583. **A. spira** (*de Roissy*). Scinde.
P 580. **A. granulosa,** *d'Arch.* ,,
P 584. **A. placentula** (*Desh.*). ,,
P 585. **A. mamillata,** *d'Arch.* ,,
P 591. **A. Leymeriei,** *d'Arch.* ,,
P 589. ,, near **granulosa,** *d'Arch.* Scinde.
P 590. **Patellina ? pedunculata** (**Cyclolina,** *Carter*). Scinde.
P 581. ,, **? Cooki** (**Conulites,** *Carter*). Scinde

BOLAN PASS.

P 545. **Assilina** and **Nummulites** in Nummulitic rock (piece of waterworn fragment). Bolan Pass.
P 567. **Nummulina** and **Orbitoides,** forming a hard cream-coloured limestone. "Nummulitic limestone between Dadur and Kirta. Bolan Pass."
P 540. Piece of waterworn Nummulitic and Orbitoidal rock, with **N. complanata** and **O. Fortisii,** polished. Kirta, Bolan Pass.
P 554. **Orbitoides** and **Nummulina** (obscure). Hard pinkish marble. Nummulitic limestone between Kirta and Dadur*, near entrance of the Bolan Pass.
P 564. A piece of fine-grained white "sandstone between Kirta and Dadur; beneath the Nummulitic limestone. Bolan Pass."
P 552. **Alveolina** (obscure) in hard pinkish *Alveolina*-limestone. Between Bibinani and Kirta (on S.E.), in the Bolan Pass.
P 545. Fragment of *Alveolina*-rock, containing a small form of **Alveolina.** Partly polished and partly waterworn (or dissolved). Bolan Pass.
P 552. Hard pinkish *Alveolina* (?) limestone. Bibinani, Bolan Pass.
P 1161. A piece of shale from the "Coal-formation." "Bolan Pass."

INDIA (NORTHERN).

SIVALIKS.

P 533. **Assilina (Nummulites) exponens,** *Sow.* Subathoo (?), Sivalik Hills (Sub-Himalayan). Major Vicary Coll.†

* Dadur is a town in Beloochistan, 5 miles E. of the Bolan Pass.

† Major Vicary sent home to Sir R. I. Murchison a collection of Nummulites and other fossils from Subathoo, about 16 miles S.W. of Simla, in 1848. These are probably some of that collection. See Quart. Journ. Geol. Soc. vol. ix. 1853, p. 71; see also the 'Manual of the Geology of India,' by Medlicot and Blanford, 8vo, Calcutta, 1879, vol. ii. pp. 524, 531.

P 527. } **A. spira** (*Roissy*). Sivalik Hills (Subathoo?).
P 541. } Major Vicary Coll.

P 536. **Nummulites perforata** (*de M.*). Variety, *thick and undulate.* Sivalik Hills. Major Vicary Coll.

One specimen that has been rounded may have been either *globular* or *undulate thick.*

P 530. **N. complanata,** var., and **N. biaritzensis?** Thick, median section. Sivalik Hills. Major Vicary Coll.

P 538. **N. complanata.** Thin variety. Sivalik Hills. ,,

P 531. ,, ,, (Split.) Sivalik Hills. ,,

P 537. Waterworn fragment of Nummulitic limestone, with **N. complanata, N. complanata** var., and **Assilina.** Sivalik Hills. Major Vicary Coll.

P 526. }
P 542. } **N. biaritzensis.** Sivalik Hills (Subathoo?). ,,
P 543. }

P 555. **N. complanata** and **Assilina exponens** (?). Constituting a white Nummulitic limestone. India.
Major Vicary Coll. From the Museum of Practical Geology.

P 560. **N. perforata.** White, in red Nummulitic limestone. India.
Major Vicary Coll. From the Museum of Practical Geology.

P 533. **N. perforata** and **Orbitoides dispansa.** In Nummulitic limestone. India.
Major Vicary Coll. From the Museum of Practical Geology.

INDIA (NORTH-EASTERN).

Silhet.

P 532. **Assilina (Nummulites) exponens,** *Sow.* Split medianly. Silhet, N.E. India.

P 534. **Assilina**-rock (**A. exponens,** *Sow.*). Polished. Silhet, N.E. India.

54976. **Nummulites complanata.** Fragment. "Booboons Cave, Sylhet."

,, **Alveolina elliptica.** "Booboons Cave, Sylhet."

AUSTRALASIA.

TERTIARY.

SUMATRA.

Specimens from Sumatra *, described and figured by Mr. H. B. Brady in the 'Geological Magazine,' new ser. vol. ii. pp. 477, 532, and presented by Mr. D. M. Verbeek.

P 255. **Orbitoides papyracea,** &c. "V. 24."

P 259. ,, ("**dispansa?**" *Gümbel*). "2 *a*." "Boekit Poangang, Sumatra. R. D. M. Verbeek, 1873."

"Shape of Gümbel's *O. aspera,* and structure of Reuss's *O. Faujasii.*"

* For the Carboniferous specimens, see above, p. 6.

P 259. **Orbitoides papyracea**, &c. P. 536, pl. 14. f. 1. "V. 23." "The best specimens."

P 2460. **O. dispansa** and **O. Sumatrensis.** P. 536, pl. 14. f. 2, 3. "VI. 67."

P 247. **Operculina granulosa**, *Leym.* P. 532, pl. 13. f. 1 *a*, *b*, *c*. "3." "Near O. *Fleuriausii*, Reuss"?

P 245. **Nummulites variolaria.** P. 533, pl. 13. f. 2, 3. "Kalk Nias, VII."

" **Nummulites**, large.
" " middle-sized.
" " small (= **variolaria**). } "VII. 76." { Recent *planulata* of Australia?

P 256. **Nummulites Ramondi**, *Defr.* P. 534, pl. 13. f. 4, 5. "Nias, VII."

LABUAN, BORNEO.

55191. **Operculina ammonoides** (*Gronovius*), var., and **Amphistegina?** In hard brown clay, with other small fossils. Tertiary. Labuan.

JAVA.

P 249. **Amphistegina vulgaris.** Java.

See H. M. Jenkins's paper on Javan Fossils, Quart. Journ. Geol. Soc. vol. xx. pp. 56, 62.

NEW ZEALAND.

P 252. Ototara limestone. Collected by Walter Mantell.

See Quart. Journ. Geol. Soc. vol. vi. 1850, p. 328 &c.

AUSTRALIA*.

P 261. **Amphistegina**-limestone, cut and polished. **Amphistegina**, Polyzoa, &c. Flinders Island, Bass Strait.
Rev. W. B. Clarke Coll., 1848.

P 262. Solid brownish limestone with obscure white Foraminifera. "26° 50′ S. W. B. C. 114° E. Superficial on hills 80 to 200 feet. Near Freycinet Harbour in Shark Bay."
Rev. W. B. Clarke Coll.

P 260. Brownish coarsely porous limestone, with obscure Foraminifera, **Lituola Soldanii, Amphistegina** (?), Polyzoa, &c. Geelong, Port Phillip. Rev. W. B. Clarke Coll., 1856.

P 253. Small **Nummulites** (near *N. variolaria*) and **Amphistegina**? In the Muddy-Creek Tertiaries (Hamilton beds). South Australia.
T. Rupert Jones Coll.

P 250. } **Amphistegina, Planorbulina, Polymorphina**, &c. Blue Tertiary
P 251. } Clay. Australia. T. Rupert Jones Coll.

* For a list of the known fossil Foraminifera of Australia, and for full bibliographic references to geological and biological authorities, see the 'Catalogue of Australian Fossils, &c.,' by R. Etheridge, Jun., F.G.S., &c., 8vo, Cambridge, 1878, pp. 125 &c.

TERTIARY.

NORTH AMERICA.

Arctic America.

P 681. **Cornuspira foliacea** (*Philippi*). Mud-beds, Kane Valley, lat. 82° 33′ N. Nares's Voyage.

UNITED STATES: Alabama.

10673. **Orbitoides Mantelli,** marked "*Nummulites crustuloides*, S. G. M." [Morton]. In soft white limestone, consisting mainly of fragments of Polyzoa and other small organisms, with the *Orbitoides*. Alabama, U.S., N.A. Probably from G. A. Mantell.

11616. **Orbitoides Mantelli.** "Eocene" Tertiary. Soft white limestone of fragmentary Polyzoa &c., with the *Orbitoides*. Alabama, United States, N.A. Mantell Coll.

50515. **Orbitoides Mantelli.** "Eocene." Alabama. Hard white Orbitoidal limestone. J. Morris Coll.

See the paper on the geological position of this Orbitoidal limestone in Alabama, by Sir C. Lyell, Quart. Journ. Geol. Soc. vol. iv. 1848, p. 10 &c., with notes by E. Forbes and Alcide d'Orbigny. W. B. Carpenter's description and figures of *Orbitoides Mantelli*, Quart. Journ. Geol. Soc. 1850, vol. vi. p. 32 &c. pl. 6. f. 20, 21, pl. 7. f. 31; and in 'Introd. Study Foram.' 1862, p. 298 &c. pl. 20. f. 5, 6, 8, 11.

P 189. } **Truncatulina** and **Amphistegina.** Tertiary (Miocene?). Ala-
P 193. } bama. T. Rupert Jones Coll.

Maryland &c.

P 186. **Amphistegina.** "With minute shells from the inside of a *Voluta volutabilis*. Pliocene. Maryland, U.S." J. Brown Coll.

P 188. **Amphistegina.** North America.

P 192. **Miliolæ.**
P 194. **Polymorphina.**
„ **Bulimina.**
„ **Planorbulina.**
„ **Truncatulina.**
P 187. **Textulariæ.**
} Miocene. Maryland, U.S.

P 191. **Polymorphina.**
P 195. **Miliolæ.**
&c.
} Miocene. Virginia, U.S. T. R. Jones Coll.

P 1164. **Discorbina?** Miocene. North Carolina. „

P 188. **Amphistegina.** Miocene. South Carolina, U.S. „

SOUTH CAROLINA.

P 184. **Orbitoides.** Two species: one flat and rugose, one *saddled* and smooth. "Pliocene" [?]. "South Carolina."
From the Museum of Practical Geology. "Presented by the Hon. Miss Murray."

EOCENE AND MIOCENE.

Foraminiferous Rocks.

WEST INDIES.

JAMAICA.

P 322. **Alveolina**-limestone. Crofts, Clarendon. G. P. Wall Coll.

P 323. **Alveolina** and **Orbitoides** (?), limestone with. (No locality.) G. P. Wall Coll.

P 287. **Cuneolina pavonia**, *d'O.*, and one joint of **Articulina.** Pteropod Marl. Jamaica. Barrett Coll.

P 286. **Cristellaria cultrata** and **Lituola Soldanii.** Pteropod Marl. Jamaica. Barrett Coll.

P 298. } **Operculina complanata**? and **Nummulites Ramondi.** Some
P 317. } semi-silicified. Brimmer Hall, St. Mary. G. P. Wall Coll.

P 318. **O. complanata** and **Nummulites Ramondi.** Flint. Preston, St. Mary. G. P. Wall Coll.

P 293. **Nummulites perforata** (vel **Rouaulti**) and **Ramondi**, and **Orbitoides media, dispansa**, and **Mantelli.** In a waterworn fragment of Orbitoidal limestone (cut and polished) from Healthful Hill, St. Thomas-in-the-East, Jamaica*. The Hon. Edw. Chitty Coll.

P 292. **Orbitoides dispansa.** "In the Hippurite-limestone" [?]. Jamaica. Barrett Coll. 1859.

P 291. } Orbitoidal limestone. Three small pieces: one piece green,
P 298. } polished, and two pieces white. Jamaica. Barrett Coll., 1862.

P 319. **Orbitoides.** Carron Hall, St. Mary. Wall. Coll.

JAMAICA AND ANTIGUA.

P 299. **Orbitoides dispansa** and a small **Nummulites.** In flint. Orange River, Metcalfe, Jamaica. G. P. Wall Coll.

P 315. **Orbitoides Mantelli** and **Nummulites Ramondi.** In flint. Orange River, Metcalfe. G. P. Wall Coll.

* Quart. Journ. Geol. Soc. vol. xix. 1863, p. 514; see also the 'Geological Magazine,' vol. i. 1864, p. 104, note. The position of the nodular Orbitoidal limestone in shales at the base of the "White Limestone" (Miocene) is shown in the section in the 'Geologist,' vol. v. 1862, p. 373. A note on the fossils of Jamaica may be seen in the 'Annales Soc. Malacolog. Belg.' vol. xi. 1876.

P 316. **O. Mantelli.** In rock. Hopewell, Metcalfe. G. P. Wall Coll.

P 325. „ and **Nummulites Ramondi.** In grey flint. Jamaica. T. Bland Coll.

P 296. P 321. P 324. **Heterostegina.** From yellowish limestone in the base of the "White Limestone." Clarendon, Jamaica. G. P. Wall Coll.

P 295. **Amphistegina** &c. In matrix of *Placocyathus Barrettii*. Jamaica.

P 288. P 294. „ From the "White Limestone." Jamaica. Collected by W. Lennox.

P 1162. **Tinoporus (Gypsina) vesicularis,** *P. & J.* In rock. Vere, Jamaica. G. P. Wall Coll.

P 297. Foraminiferous and shelly sand. Vere, Jamaica. „

P 320. Shell-rock. Upper Clarendon. „

P 323. Oolitic rock. Thompson Town, Clarendon. „

„ Shell-rock. „ „ „

„ Pisolitic rock (flat granules). Thompson Town, Clarendon. G. P. Wall Coll.

P 289. **Nummulites radiata = Ramondi.** P 290. **Orbitoides Mantelli.** "Flint out of marl." Antigua. Nugent Coll.

TRINIDAD.

Napirima group of the Newer Parian series.

P 300–305. **Nummulites Ramondi,** *Defrance,* and **Orbitoides orakeiensis,** *Karrer.* In an asphaltic Nummulitic rock from Trinidad. T. Rupert Jones Coll.

See Quart. Journ. Geol. Soc. vol. xxii. 1866, p. 592, and "Report on the Geology of Trinidad," Mem. Geol. Surv., by G. P. Wall and J. G. Sawkins, 8vo, 1860, p. 37.

P 305. **Foraminifera** and *Lithodomus.* Collected by P. M. Duncan from an *Astræa.* St. Croix, Trinidad.

P 1028–1127. Models of Recent and Fossil Foraminifera, and Recent Foraminifera for comparison.

*Catalogue of d'Orbigny's Models**. 1826.

The species are here enumerated with revised names in a natural order of arrangement.

			No. of Model.
Recent.	Mediterranean; Red Sea; South Seas	*Vertebralina striata,* d'O.	81
Tertiary.	Paris	—— *conico-articulata* (Batsch) .	22

* D'Orbigny's Models were enumerated, with their modern nomenclature, in the Ann. & Mag. Nat. Hist. ser. 3, vol. xvi. 1865, p. 15, &c., by Parker, Jones, and Brady. Reduced figures were also given, in family groupings, in pls. 1, 2, & 3; and some notes on the occurrence and distribution of the species in the text.

			No. of Model.
Recent.	Adriatic	*Miliola* (*Biloculina*) *ringens*, Lam.	90
Tertiary.	Paris and Bordeaux		
Recent.	Adriatic	—— (——) *depressa*, d'O.	91
Tertiary.	Castel-Arquato		
,,	Pauliac (Gironde)	—— (——) *aculeata*, d'O.	31
Recent.	Mediterranean	—— (*Spiroloculina*) *planulata*,	
Tertiary.	Castel-Arquato	Lam.	92
,,	Paris; Soissons; Valognes	—— (*Triloculina*) *trigonula*, Lam.	93
Recent.	Red Sea	—— *tricarinata*, d'O.	94
,,	Adriatic; Mediterranean; Atlantic, E. & W.	—— (——) *oblonga* (Montagu)	95
Tertiary.	Soissons; Bordeaux; Dax; Castel-Arquato		
Recent.	Adriatic & Mediterranean	*Miliola* (*Quinqueloculina*) *secans*, d'O.	96
,,	,, ,,	—— (——) *lyra*, d'O.	8
Tertiary.	Paris	—— (——) *Ferussacii*, d'O.	32
,,	,,	—— (——) *saxorum*, Lam.	33
,,	Castel-Arquato	—— (*Adelosina*) *Brongniartii*, d'O. (very young)	18
,,	,,	—— (——) ——, d'O. (young)	97
,,	Paris	*Fabularia ovata* (de Roissy)	100
Recent.	Mediterranean; Rawack in New Holland	*Peneroplis pertusus* (Forsk.)	16
,,	,, ,, ,,	—— *arietinus* (Batsch)	48
Tertiary.	Paris	*Spirolina lituus* (Gmelin)	24
,,	Bordeaux	*Dendritina arbuscula*, d'O.	21
Recent.	Antilles and Marianne Isles	*Orbiculina adunca* (F. & M.)	20
,,	Madagascar	*Pavonina flabelliformis*, d'O.*	56
Tertiary.	Paris	*Alveolina sabulosa* (Montf.)	50
,,	,,	*Valvulina triangularis*, d'O.	25
,,	,,	—— *clavulus* (Lam.)	2
,,	,,	—— *Parisiensis*, d'O.	66
Recent.	Adriatic	*Nodosaria radicula* (Linn.)	1
,,	Antilles	*Lingulina carinata*, d'O.	26
Tertiary.	Sienna		
Recent.	Adriatic	—— *hasta*, d'O.	52
,,	,,	*Glandulina glans*, d'O.	51
,,	,,	*Frondicularia rhomboidalis*, d'O.	3
,,	,,	*Dentalina obliqua*, d'O.	5
,,	,,	*Vaginulina elegans*, d'O.	54
,,	,,	—— *tricarinata*, d'O.	4
,,	,,	*Marginulina raphanus* (Linn.)	6
Tertiary.	Castel-Arquato		
,,	Sienna	—— *glabra*, d'O.	55
Recent.	Adriatic	*Rimulina glabra*, d'O.	53
,,	,,	*Planularia cymba*, d'O.	27
,,	,,	*Cristellaria cultrata* (Montf.)	82
Tertiary.	Vienna		
Recent.	Adriatic	—— *virgata*, d'O.	14

* See H. B. Brady's note on a specimen from the Seychelles, Ann. & Mag. Nat. Hist. January 1877, p. 41; and his description in the Quart. Microsc. Journ. vol. xix. 1879. p. 68.

			No. of Model.
Recent. Tertiary.	Adriatic ..... Sienna.....	*Cristellaria italica* (Defr.)	85
Recent. Tertiary.	Adriatic ..... Sienna.....	—— ——. Young	19
Jurassic.	Caen	—— *lævigata*, d'O.....	47
Recent. Tertiary.	Adriatic ..... Sienna.....	—— *cassis* (F. & M.).....	83
Recent. Tertiary.	Adriatic ..... Sienna.....	—— ——. Young	44
Recent.	Adriatic	—— *costata*, d'O. (small or young *Planularia auris*)	84
„ Tertiary.	„ ..... Paris, Bordeaux, Dax, and Castel-Arquato	*Polymorphina lactea* (W. & J.)..	62
„	Bordeaux.....	—— *burdigalensis*, d'O.....	29
„	Paris	—— *Thouini*, d'O.....	23
„	Castel-Arquato	—— *problema*, d'O.	61
„	„	—— *gutta*, d'O.	30
Recent. Tertiary.	Atlantic and Adriatic .. Grignon, Dax, Bordeaux, Chavagnes, and Castel-Arquato	—— *gibba*, d'O.	63
Recent.	Mediterranean	*Dimorphina tuberosa*, d'O.....	60
Tertiary.	Sienna.....	*Uvigerina pygmæa*, d'O.	67
Recent.	Adriatic	*Globigerina bulloides*, d'O..... —— ——. Young	76 17
Ballast-sand	.....	*Pullenia sphæroides*, d'O.	43
Recent. Tertiary.	Adriatic and Isle of France Sienna.....	*Sphæroidina bulloides*, d'O.	65
Recent.	Adriatic	*Textularia pygmæa*, d'O.	7
„ Tertiary.	Mediterranean ..... Castel-Arquato	—— *gibbosa*, d'O.	28
Recent.	Mediterranean	*Bigenerina digitata*, d'O.	58
„	Adriatic	—— *nodosaria*, d'O.	57
„	„	*Grammostomum pennatula* (Batsch)	59
„	„	*Bulimina elegans*, d'O.	9
„	„	—— *caudigera*, d'O.	68
Tertiary.	Sienna.....	*Virgulina squamosa*, d'O.	64
Ballast-sand	.....	*Cassidulina lævigata*, d'O.	41
Tertiary.	Paris	*Discorbina turbo* (d'O.)	73
Recent.	Atlantic	—— *globularis* (d'O.).....	69
Tertiary.	Paris	—— *parisiensis* (d'O.)	38
„	Bordeaux.....	—— *rosacea* (d'O.).....	39
„	Valognes	—— *vesicularis* (Lam.).....	72
„	Bordeaux.....	—— *elegans* (d'O.).....	42
Recent.	Mediterranean	*Planorbulina mediterranensis*, d'O.	79
„	Atlantic	—— *nitida*, d'O.....	78
„	Adriatic; Mediterranean; Rawack; Madagascar; Cape of Good Hope.	—— (*Truncatulina*) *refulgens* (Montf.)	77
„ Tertiary.	European Seas ..... Paris; Bordeaux; Castel-Arquato	—— (——) *lobatula* (W. & J.)..	37
Recent.	Adriatic	—— *ariminensis*, d'O.	49
„	The Antilles; Martinique; Point Corbet	—— *rosea*, d'O.	35

			No. of Model.
	No loc.	*Pulvinulina pulchella* (d'O.)	71
Recent.	Adriatic	—— *Menardii* (d'O.)	10
„	„	—— *punctulata* (d'O.)	12
„	Atlantic; Isle of Martinique.	*Rotalia Beccarii* (Linn.). [European form.]	74
„	Atlantic at Noirmoutier	—— —— (Linn.). [West-Indian form.]	75
„	Adriatic	—— *orbicularis*, d'O.	13
„	„	—— *Soldanii*, d'O.	36
„	Martinique; Isle of France; Madagascar	*Calcarina Spengleri* (Gmelin)	34
„	Cayenne; Martinique	—— *armata*, d'O.	70
Tertiary.	Chavagnes; Nantes; Bordeaux		
Ballast-sand		—— *bisaculeata*, d'O.	15
Cretaceous.	Maestricht	—— *lævigata*, d'O. [Smooth form of *C. calcitrapoides* (Lam.).]	89
Tertiary.	L. of Tau; Bordeaux	*Amphistegina vulgaris*, d'O.	40
Recent.	Isle of France	—— *Lessoni*, d'O.	98
Tertiary.	Bordeaux	*Operculina complanata* (Defr.)	80
Recent.	South Sea at Rawack	—— vel *Assilina discoidalis*, d'O.	88
	No loc.	*Nummulites planulata*, Lam. [Model made from a rather convex, young individual; and the aperture is wrongly placed.]	87
Recent.	Adriatic, Mediterranean, and Atlantic.	*Polystomella crispa* (Linn.) [Aperture wrongly placed.]	45
Tertiary.	Paris	*Nonionina incrassata* (F. & M.) [Aperture wrongly placed.]	46
Recent.	Adriatic and Mediterranean	—— *pompilioides* (F. & M.)	86
Tertiary.	Bordeaux and Sienna		
Recent.	Adriatic	—— *limba*, d'O.	11
„	St. Helena	*Heterostegina depressa*, d'O.	99

The 'Modèles' were issued (about 1823–26) in four *Livraisons*, each containing 25, in the order of the numbered tickets, not with any particular arrangement. A *fifth* Livraison is referred to in some of d'Orbigny's works, for instance, 'Hist. Foraminifères de Cuba,' p. xxi, note; p. xxxvii, Modèle no. 113, livr. 5, *Citharina*; p. xxxviii, Modèle no. 114, livr. 5, *Hauerina*; and 'Foram. foss. Vienne,' p. 240, &c.

With some of the sets issued to early subscribers were added specimens of the Foraminifera themselves. A few of one of these sets have been preserved in the following group:—

A set (incomplete) of Recent and Fossil Foraminifera, illustrated by Alcide d'Orbigny's Models or Figures.

P 964. **Triloculina trigonula** (*Lam.*). Tertiary, near Paris.
Model, no. 93.

P 958. **Quinqueloculina secans**, *d'O.* Recent. Mediterranean, near Cette.
Model, no. 96.

P 951. **Q. saxorum** (*Lam.*). Tertiary, near Paris.
Model, no. 33.

P 963. **Fabularia ovata** (*Roissy*). Tertiary, near Paris.
Model, no. 100. Ann. M. N. H. Sept. 1863, p. 203.

P 957. **Dendritina arbuscula**, *d'O.* Tertiary. Bordeaux.
Model, no. 21.

P 929. **Alveolina sabulosa** (*Montf.*). Tertiary. Near Paris.
Model, no. 50.

P 965. **A. oblonga**, *d'O.* Tertiary. Near Soissons.
(Near to model no. 50.)

P 967. **Textularia aciculata**, *d'O.* Recent. Adriatic.
Ann. Sc. nat. vii. p. 263, pl. 11. f. 1–4.

P 950. **Discorbina rosacea** (*d'O.*). Tertiary. Castel-Arquato.
Model, no. 39.

P 961. **D. trochidiformis** (*Lam.*). Tertiary. Near Paris.
(Model, no. 73 is a variety.)

„ **Rotalia Beccarii** (*Lin.*). Recent. Adriatic, near Rimini.
Model, no. 74.

P 949. **Polystomella crispa** (*Lin.*). Recent. Atlantic or Mediterranean.
Model, no. 45.

P 966. **Calcarina Defrancii**, *d'O.* Recent. Red Sea.
Ann. Sci. Nat. vii. p. 276, pl. 13. f. 5–7 *bis*.

P 960. **Amphistegina vulgaris**, *d'O.* Tertiary. Bordeaux or Dax.
Model, no. 40.

P 956. **Operculina complanata** (*Defr.*). Tertiary. Bordeaux.
Model, no. 80.

P 962. **Operculina** vel **Assilina discoidalis**. Recent. Rawack, New Holland.
Model, no. 88.

„ **Nummulites radiata** (F. & M.). Recent. Rawack, New Holland.
This is labelled "*N. discoidalis*, d'O."; but it differs from it.

Models of Foraminifera, by Prof. E. A. von Reuss and Dr. A. Fritsch (Frič), of Prague, 1861 (and 1865).

The species for this set of a hundred Models were selected so as to supply a perfect series of types of families, and at the same time to complete A. d'Orbigny's suite of Models already mentioned (see page 70).

A critical notice of these Models, by Messrs. Parker, Jones, and Brady, was published in the Ann. & Mag. Nat. Hist. July 1865, pp. 38–41, with the best known synonyms of some of the more common forms, and the recognized types of generic groups.

There were a few important differences as to the generic standing of some forms expressed in this critique, especially as to no. 13 (of the nos. applied in 1861), no. 58, no. 72 (but not held afterwards by the critics), nos. 73 and 74 (in which case the critics were decidedly wrong), no. 85, and no. 95. Nos. 78, 79, and 80, *op. cit.* p. 40, stand opposite to wrong typical species, owing to an upward slip of the printer's type.

In the following list the geological stages to which the species belong have in a few instances been corrected from notes by the authors of these Models.

The Numbers given with the Models in 1861 are consecutive (1–100) with the species as enumerated in the following List. In 1865 the Nos. issued with the Models were those given in this List.

I. *Foraminifera with non-porous shells.*

A. With siliceous sandy shells.

I. Lituolidea, *Reuss.*

Nos. with the published Models in 1865.		Geological stages for the Specimens figured.
2.	*Placopsilina irregularis*, d'Orb.	Upper Chalk.
1.	*Haplostiche fœdissima*, Rss.	,,
3.	*Haplophragmium inflatum*, Rss.	,,
70.	—— *irregulare* (Rœm.)	Chalk.

II. Uvellidea, *Reuss.*

95.	*Valvulina triangularis*, d'O.	Eocene.
4.	*Verneuilina spinulosa*, Rss.	Miocene.
5.	*Tritaxia tricarinata* (d'O.)	Cretaceous.
6. 7.	*Ataxophragmium variabile*, d'O.	Chalk and Gault.
98.	*Clavulina communis*, d'O.	Tertiary.
8.	*Gaudryina pupoides*, d'O.	Upper and Middle Chalk.
58.	*Bigenerina nodosaria*, d'O.	Recent.
71.	*Conulina conica*, d'O. [Lituolid ?]	,,
84.	*Chrysalidina gradata*, d'O.	Cretaceous.

B. With compact, porcellaneous, calcareous shells.

I. Squamulinidea, *Reuss.*

II. Miliolidea, *Reuss.*

9.	*Cornuspira involvens*, Rss.	Miocene.
82.	*Uniloculina indica*, d'O.	Recent.
10.	*Biloculina lunula*, d'O.	Tertiary.
81.	*Spiroloculina dilatata*, d'O.	Miocene.
11.	*Triloculina gibba*, d'O.	Tertiary.
99.	*Quinqueloculina*, sp., d'O.	,,
12.	*Fabularia discolithus*, Defr.	Eocene.

III. Peneroplidea, *Reuss.*

61.	*Peneroplis pulchellus*, d'O.	Recent.
91.	—— *planatus* (Montf.)	,,
14.	*Dendritina arbuscula*, d'O.	,,

Nos.		Geol. stages.
76.	*Spirolina Austriaca*, d'O.	Middle Tertiary.
60.	*Vertebralina mucronata*, d'O.	Recent.
13.	*Hauerina compressa*, d'O.	Miocene.
57.	*Pavonina flabelloides*, d'O. [Textularian. See H. B. Brady's remarks in the Quart. Microsc. Journ. vol. xix. 1879, p. 68.]	Recent.

IV. Orbitolitidea, *Reuss*.

88.	*Cyclolina cretacea*, d'O. [The apertures should not be marked on the *edge* of the last ring; but its *surface* should have pores. See Ann. & Mag. Nat. Hist. ser. 3, vol. vi. p. 37.]	Chalk-marl.
90.	*Orbitolites macropora*, Lam.	Maestricht Chalk.

II. *Foraminifera with porous shells.*

A. With hyaline, finely porous, calcareous shells.

I. Spirillidea, *Reuss*.

73.	*Spirillina punctata*, d'O.	Tertiary and Recent.

II. Ovulitidea, *Reuss*.

15.	*Ovulites margaritacea*, Lam. [Porcellaneous and Dactyloporidan. See Ann. & Mag. Nat. Hist. July 1877, p. 78.]	Eocene.

III. Rhabdoidea, *Reuss*.

55.	*Lagena simplex*, Rss.	Upper Chalk.
16.	—— *vulgaris*, Williamson	Recent.
17.	*Fissurina carinata*, Rss.	Tertiary.
18.	*Nodosaria tetragona*, Rss.	Gault.
19.	—— *inflata*, Rss.	Upper Chalk.
20.	—— *lepida*, Rss.	"
21.	*Orthocerina quadrilatera*, d'O.	Recent.
67.	*Dentalina acuminata*, Rss.	Upper Chalk.
66.	—— *Lorneiana*, d'O.	"
56.	*Vaginulina Badenensis*, d'O.	Upper Tertiaries.
89.	—— *transversalis*, Rss.	Gault.
87.	—— *cristellarioides*, Rss.	Lower Greensand.
51.	*Rimulina glabra*, d'O.	Recent.
23.	*Frondicularia lanceola*, Rss.	Upper Chalk.
22.	—— *Goldfussii*, Rss.	"
59.	—— *turgida*, Rss.	Chalk-marl.
26.	*Rhabdogonium acutangulum*, Rss.	Lower Greensand.
27.	—— *Martensi*, Rss.	"
68.	*Amphimorphina Haueri*, Neugeb.	Miocene.
28.	*Dentalinopsis semitriquetra*, Rss.	Lower Greensand.
25.	*Flabellina oblonga*, von Münster	Tertiary.
24.	—— *cordata*, Rss.	Upper Chalk.

Nos.		Geol. stages.
29.	*Psecadium ellipticum*, Rss.	Miocene.
64.	*Lingulina costata*, d'O.	"
30.	*Lingulinopsis bohemica*, Rss.	Chalk-marl.
31.	*Pleurostomella fusiformis*, Rss.	Gault.
	[Near to *Bulimina*.]	

IV. Cristellaridea, *Reuss*.

62.	*Marginulina ensis*, d'O.	Upper Chalk.
86.	—— *bullata*, Rœmer	"
75.	*Cristellaria Josephina*, d'O.	Middle Tertiary.
32.	—— *rotulata*, Lam.	Cretaceous.
33.	*Robulina deformis*, Rss.	Tertiary.

V. Polymorphinidea, *Reuss*.

35.	*Bulimina pupoides*, d'O. (β.)	Tertiary and Recent.
36.	*Virgulina pertusa*, Rss.	Tertiary.
93.	*Uvigerina pygmæa*, d'O.	"
72.	*Polymorphina complanata*, d'O.	Miocene.
96.	*Pyrulina gutta*, d'O.	Tertiary.
52.	*Globulina æqualis*, d'O.	Upper Tertiary.
34.	*Guttulina Austriaca*, d'O.	Tertiary.
37.	*Sphæroidina Austriaca*, d'O.	"
94.	*Dimorphina obliqua*, d'O.	"
	[See Memoir on the *Polymorphinæ* by Brady, Parker, and Jones, Trans. Linn. Soc. vol. xxvii. p. 250, pl. 42. f. 40.]	

VI. Cryptostegia, *Reuss*.

[For latest information on these interesting forms, see H. B. Brady's remarks in the Quart. Microsc. Journ. vol. xix. p. 66.]

38.	*Chilostomella ovoidea*, Rss.	Tertiary.
39.	*Allomorphina cretacea*, Rss.	Upper Chalk.

VII. Textilaridea, *Reuss*.

40.	*Textilaria conulus*, Rss.	Upper Chalk.
41.	*Proroporus complanatus*, Rss.	Gault.
83.	*Sagraina pulchella*, d'O.	Recent.
85.	*Vulvulina gramen*, d'O.	"
97.	*Bolivina Beyrichi*, Rss.	Tertiary.
42.	*Schizophora Neugeboreni*, Rss.	Miocene.

VIII. Cassidulinidea, *Reuss*.

43.	*Cassidulina crassa*, d'O.	Recent.
44.	*Ehrenbergina serrata*, Rss.	Miocene.

B. Foraminifera with very porous calcareous shells.

I. Rotalidea, *Reuss*.

78.	*Pulvinulina Brongniarti* (d'O.)	Miocene.
46.	*Rotalia Girardana*, Rss.	Tertiary.

Nos.		Geol. stages.
45.	*Bulimina* ? *buliminoides* (*Rotalia*, Rss.)..... [*Bulimina* probably.]	Tertiary.
48.	*Siphonina* (*Planorbulina*) *reticulata*, Rss.	Miocene.
47.	*Discorbina planorbis* (d'O.)	Tertiary.
53. 54.	*Siderolithes* (*Calcarina*) *calcitrapoides*, Lam. ..	Chalk of Maestricht.
79.	*Planorbulina Mediterranea*, d'O.	Recent.
69.	*Globigerina bulloides*, d'O.	Tertiary.
74.	*Orbulina universa*, d'O.	Tertiary and Recent.

C. With calcareous shells traversed by an intermediate canal-system.

I. Polystomellidea, *Reuss.*

77.	*Polystomella aculeata*, d'O.	Tertiary and Recent.
63.	*Nonionina communis*, d'O.	Tertiary.
49.	*Pullenia bulloides* (d'O.)..... [Near to *Globigerina*. See Carpenter's Introd. Foram. p. 184, and Ann. & Mag. Nat. Hist. July 1865, p. 261.]	Tertiary and Recent.
50.	*Fusulina cylindrica*, Fischer	Carboniferous Limestone.

II. Nummulitidea, *Reuss.*

65.	*Amphistegina Quoyi*, d'O.....	Recent.
100.	*Operculina*, sp. (After Carpenter.).....	„
92.	*Heterostegina*, sp. (After Carpenter.)	„
80.	—— *costata*, d'O.	Miocene.

55184. **Zittel's Model of a Nummulite.** Ideal model of a Nummulite (greatly enlarged), of the group of **Nummulina striata**, *d'Orb.*, showing both a longitudinal and a transverse section; by Prof. Zittel.

Recent Foraminifera, for comparison with the fossil forms.

From the Colne River, near Colchester.

P 85.	**Triloculina oblonga** &c.	J. Brown Coll.
„	**Quinqueloculina seminulum** and **Q. Brongniarti.**	
„	**Nonionina depressula.**	
„	**Rotalia Beccarii.**	
„	**Polystomella crispa.**	

Partly figured by G. Sowerby in 1856 in an unpaged, unpublished note, with one plate.

P 88. **Rotalia Beccarii** (*Lin.*) &c. England. J. Brown Coll.

From Nevis, West Indies.

P 86. **Orbiculina adunca** (*F. & M.*).
„ **O. orbiculus** (*F. & M.*).

See Williamson, Trans. Micros. Soc. ser. 1, vol. iii. p. 120; Carpenter, Phil. Trans. 1856, p. 547; and Parker and Jones, Ann. & Mag. Nat. Hist. ser. 3, vol. v. p. 180.

From the Mediterranean?

P 87. **Quinqueloculina.**
„ **Peneroplis pertusa** (*Forsk.*).
„ **Orbitolites complanata,** *Lam.*
„ **Rotalia Beccarii** (*Lin.*). Thick var.

Australia?

54874. **Tinoporus baculatus** (*de M.*). Torres Straits? Van Breda Coll.

Australia.

P 79. **Tinoporus (Gypsina) baculatus,** *Carpenter.*
„ **Calcarina Spengleri** (*Gmelin*). } Australia. Jukes Coll.
P 78. **Tinoporus (Gypsina) vesicularis,** *Parker & Jones.* Australia. Jukes Coll.

New Zealand.

P 83. **Tinoporus baculatus,** *Carp.*
P 81. **Calcarina Spengleri** (*Gmelin*).
P 82. **Operculina ammonoides** (*Gronov.*). Large var.
P 80. **Amphistegina vulgaris?,** *d'Orb.*
} New Zealand. S. P. Woodward.

Jamaica.

P 307. **Cristellaria calcar** (*Lin.*).
„ **C. cultrata** (*de M.*).
P 306. **Frondicularia complanata,** *Defr.*, var. **annularis** (?), *d'Orb.*
„ **Lingulina carinata,** *d'Orb.*
P 307. **Textularia Barrettii,** *P. & J.**

* Annales Soc. Malacolog. Belg. (1878) vol. xi., for 1876 (p. 10 and 11 of article), woodcut.

A series of recent and fossil Foraminifera, numbered 1–48 *b*.

P 279.	(1)	**Marginulina raphanus** (*Lin.*). The one-sided or excentric *Nodosaria* *.	Recent; from Rimini in the Adriatic.
„	(2*a*)	**Nodosaria obliqua** (*Lin.*).	
„	(4)	**Polystomella macella** (*F. & M.*).	
„	(5)	**P. crispa** (*Lin.*).	
„	(6)	**Globigerina bulloides**, *d'Orb.*	
„	(6*a*)	**Dentalina communis**, *d'Orb.*	
„	(7)	**Cristellaria ariminensis**, *d'Orb.*	
„	(8)	**C. cassis** (*F. & M.*).	
„	(8*a*)	**C. cymba**, *d'Orb.*	
„	(8*b*)	**Planorbulina Haidingeri** (*d'Orb.*).	
„	(8*c*)	**Discorbina parisiensis?** (*d'Orb.*).	
„	(9)	**Miliola seminulum** (*Lin.*) &c.	
„	(11)	**Rotalia Beccarii** (*Lin.*).	
„	(12)		
P 281.	(13)	**Alveolina sabulosa** (*Montf.*).	Tertiary.
„	(14)		
P 282.	(16)	**Miliola (Quinqueloculina) saxorum**, *Lam.*	
	(17)	*Bairdia subdeltoidea* (Münster). A bivalved Entomostracan.	
P 282.	(18)	**Quinqueloculina.**	
„	(19)	**Spiroloculina.**	
„	(20)	**Quinqueloculina Brongniartii**, *d'Orb.*	
„	(21)	**Miliola trigonula** (*Lam.*), **seminulum** (*Lin.*), &c.	
„	(23)	**M. trigonula**, *Lam.*	
„	(23*a*)	**M. (Uniloculina).** Rare.	
P 283.	(25)	**Operculina ammonoides** (*Gronov.*), var.	Recent; from out of a Coral, West Indies.
P 278.	(26)	**O. complanata** (*Defrance*).	Tertiary.
„	(27)	**Nummulina planulata** (*Lam.*).	
„	(28)	**Calcarina Spengleri.** (Maestricht? Cretaceous?)	
„	(29)	**Nummulites variolaria** (*Lam.*). Tertiary.	
„	(30)	**Nummulites.** Tertiary.	
„	(31)		
„	(31*a*)		

* See Ann. & Mag. Nat. Hist. ser. 3, vol. xii. 1863, p. 432 &c.

P 277. (32)	**Fabularia ovata** (*de Roissy*); **discolithus**, *Defr.*		Tertiary. France?
„ (33)			
„ (34)	**Vertebralina** (**Renulina**) **opercularis.** Rare *.		
„ (35)	**Nummulites lævigata**, *Lam.* Young.		
P 276. (36)	**Valvulina triangularis.**		
„ (37)	**V. conica?**		
„ (39*b*)	**Discorbina vesicularis** (*d'Orb.*).		Tertiary. France?
P 284. (39)	**Discorbina.**		
P 276. (40)	**D. trochidiformis** (*Lam.*).		
„ (41)			
P 285. (42)	**D. globularis** (*d'Orb.*).		
P 285. (42*a*–48*b*)	**Peneroplis pertusa**, *Forskål.* **P.** (**Dendritina**) **arbuscula**, *d'Orb.* **P.** (**Spirolina**) **lituus** (*Gmelin*), and other varieties †		Recent.

* Referred to as *Peneroplis* by d'Orbigny in his 'Prodrome Pal.' &c., vol. ii. 1850, p. 407; but really a *Vertebralina* of the Articulina group. See Ann. & Mag. Nat. Hist. ser. 3, vol. v. 1860, p. 471 &c.

† See Ann. & Mag. Nat. Hist. ser. 3, vol. v. pp. 297, 466, &c., and vol. xvi. p. 22 &c.

SUPPLEMENTAL NOTES,

CONSISTING OF

REMARKS ON SOME OF THE MOST IMPORTANT GROUPS OF FORAMINIFERA MENTIONED IN THE FOREGOING CATALOGUE.

I. NOTE ON EOZOÖN.

(See page 1.)

Eozoön is a Foraminifer with hyaline and vascular shell-structure, and very numerous irregular minute chambers, outspread for about a square foot, and heaped up nearly half as high, with diminishing size.

The sarcode has been replaced by magnesian silicates (as is frequently the case with interiors of both recent and fossil shells and tests of small size). The chamber-walls had apparently a tubularity, like that of *Nummulina*—this being in many cases traceable, by the tubuli having been occupied by very fine parallel threads of silicate, difficult of discrimination from a simply fibrous mineral. Where the white calcareous bands are thick, we have in them the "intermediate" or "supplemental skeleton," traversed by numerous ramifying and sometimes lobular threads of silicate, sometimes of calcite, representing the pseudopodial passages and vestibules. The stolons, also, from chamber to chamber, are sometimes apparent. The chambers are irregular in size; and, though separated sometimes by the thickest layers of "supplemental skeleton," are often close together, indeed packed so closely that the rock is there merely a mass of granular silicate, representing the scarcely divided segments of sarcode. The enormous pressure (*lateral* as well as vertical) to which the rock has been subject has modified the organism to a vast extent in many places.

The following are the chief memoirs treating of *Eozoön*:—

W. Logan, Q. J. G. S. vol. xxi. 1865, p. 45 &c.
J. W. Dawson, " " p. 53 &c. } Canad. Nat. April
W. B. Carpenter, " " p. 58 &c. } 1865.
T. S. Hunt, " " p. 67 &c.
T. R. Jones, Popul. Science Rev. vol. iv. 1865, p. 343 &c.
W. B. Carpenter, Intell. Observ. no. xl. 1865, p. 278 &c.
——, Proc. Royal Soc. no. 93, 1867, p. 503 &c.
——, 'The Microscope,' &c. 4th ed. 1868, p. 517 &c.
——, Ann. & Mag. Nat. Hist. June 1874.
J. W. Dawson, 'The Dawn of Life,' 8vo, London, 1875.
T. R. Jones, in 'Micrographical Dict.,' article "*Eozoön*," 1875.
J. W. Dawson, Q. J. G. S. vol. xxxii. 1876, p. 66 &c.

Among those who object to the animal origin of "*Eozoön*" are :—

Messrs. King and Rowney, Quart. Journ. Geol. Soc. vol. xxii. pp. 185–218, 1866;

H. J. Carter, Ann. & Mag. Nat. Hist. 4th ser. vol. xvi. 1875, p. 420; 5th ser. vol. i. 1878, p. 310;

K. Möbius, 'Palæontographica,' Band xxv. 1879, pp. 175–192, Taf. 23–40; ——, 'Nature,' July 17 & 24, 1879.

II. THE RECEPTACULIDÆ.

(See pages 2–4.)

These Rhizopodal fossils are not exhaustively treated of in this place. Some only of the best-known of the *Receptaculites*, *Ischadites*, *Sphærospongia*, and *Sphæronites* are represented in the collection.

Receptaculites was referred definitely to the Foraminifera, and to a special family (the *Receptaculidæ*), by Dr. C. W. Gümbel in 1875. It possesses a skeleton consisting of two walls or floors, made up of rhombic plates, fitting one to another. These floors or decks are separated, and at the same time supported and united, by a great number of thickish, calcareous, vascular columns, which are individually traversed by an internal canal, ending in ramifications in each of the floors. This constitutes an anastomosing canal-system, corresponding with that of some Foraminifera, especially the Dactyloporidæ. *Ischadites*, Kœnig, and *Tetragonis*, Eichwald, also belong to the group of *Receptaculidæ*.

For the Bibliography of these fossils, the following works are important :—

J. W. Salter. "Figures and Descriptions of Canadian Organic Remains." Decade I. Geol. Survey of Canada. 8vo. Montreal, 1859, p. 43, pl. 10.

E. Billings. "Notes on some of the more remarkable Genera of Silurian and Devonian Fossils," Canadian Naturalist and Geologist, new ser. vol. ii. 1865, p. 184 &c., woodcut.

J. J. Bigsby. Thesaurus Siluricus, 4to. London, 1868, p. 4; and Thesaurus Devonico-Carboniferus, 4to, London, 1878, p. 6.

C. W. Gümbel. "Remarks on the Organization and Systematic Position of *Receptaculites*," Transact. Royal Bavarian Acad. Sciences; Math.-phys. Class, vol. xii. part 1. 4to. Munich, 1875, pl. A.; Geol. Mag. 2nd ser. vol. iii. p. 127.

J. W. Dawson. The Dawn of Life. 8vo. London, 1875, p. 162.

Nicholson. Palæontology. 2nd edit. vol. i. p. 126.

III. FUSULINA, *Fischer de Waldheim.*

(See pages 5 & 6.)

Fusulinæ characterize certain rocks of the Carboniferous System in Spain (Cantabrian chain) and the Southern Alps (Upper Carniola and Carinthia), Russia (in many localities), the Caucasus (Armenia and Azerbeidjan), Isle of Chios, North America (California, Nebraska, Kansas, Missouri, Illinois, Ohio, and Texas, including *Permian* species), Borneo, Sumatra.

For the Bibliography see :—

For the Alps :

E. Suess. Imp. Geol. Instit. Vienna, 1870; and Quart. Journ. Geol. Soc. vol. xxvi. Miscell. part, p. 3.

G. Stache. Imp. Geol. Instit. Vienna, 1876; and Geol. Mag. n. s. vol. iv. p. 165.

For Russia :

Rschewsky, 1826; Fischer de Waldheim, 1830; J. Bock, Ehrenberg, 1842-1854; Rouillier and Vosinsky, 1849; d'Eichwald, 1859. These and many observers of Russian *Fusulinæ* are referred to by—

V. von Möller. Mém. Acad. Sci. St.-Pétersbourg, sér. 7, vol. xxv. no. 9, 1878, p. 45 &c.; and Ann. & Mag. N. H. March 1881.

A. D'Orbigny in Murchison, de Verneuil, and Keyserling's Geology of Russia, 1845, vol. ii. p. 161, pl. 1. figs. 1 *a–f*.
Parker and Jones. Ann. & Mag. N. H. ser. 3, vol. viii. 1861, p. 166.
Carpenter, Parker, and Jones. Introd. Foram. 1862, p. 304.
Carpenter. Monthly Microsc. Journ. April 1870, p. 177.
Parker and Jones. Ann. & Mag. N. H. ser. 4, vol. x. 1872, p. 260.
H. B. Brady. Monogr. Perm. and Carbonif. Foram. 1876, p. 46; Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. 1876, p. 414, pl. 18.

For the Caucasus:
Abich. Mém. Acad. Imp. Sci. St.-Pét. sér. 6, vol. vii. p. 528, pl. 3. figs. 13 *a*, *b*, *c*.

For Chios:
Stache. *Loc. cit.*

For America:
Shumard. Trans. St.-Louis Acad. Sci. vol. i. 1858, p. 397.
Meek and Hayden. Palæont. California, 1864, p. 3; Palæont. Upper Missouri, part i. 1865, p. 14 &c.

IV. ORBITOLINA=PATELLINA.

(See pages 10, 17, and 19.)

The name *Orbitolina* has been applied to two different organisms. One of these has been of late years referred to Williamson's genus *Patellina*, which, though very small and delicate in British seas, formerly existed (in Cretaceous times) of much larger and relatively gigantic size. This is the *Patellina lenticularis* (*Madreporites*, Blumenbach) of the Perte-du-Rhône and elsewhere.

The other organism (globular, conical, or concavo-convex in form) is the "*Orbulites pileolus*" of Lamarck, and the "*Millepora*? *globularis*" of Phillips; and it has also passed under other names. Of late years Steinmann and Carter have determined that this little fossil is Hydractinian in its relationship; and the former has referred it to the new genus *Porosphæra*. Some of the smallest specimens so much resemble *Tinoporus vesicularis*, that Parker and Jones referred both the globular and conical forms of this fossil to the genus.

The following remarks on *Patellina lenticularis* may be useful:—This is the *Madreporites lenticularis* of Blumenbach, 1805, according to Bronn; also the *Orbulites lenticulata* of Lamarck (1816) and of Lamouroux. Referred to *Orbitolina* as a Foraminifer by d'Orbigny in 1847, it was put into relationship with several allies by Parker and Jones in the Ann. & Mag. Nat. Hist. 1860, ser. 3, vol. vi. p. 29 &c.; and these were subsequently revised by Carpenter, Parker, and Jones in the 'Introduction to the Study of the Foraminifera,' 1862, p. 223 &c., and in the Ann. & Mag. Nat. Hist. September 1863, p. 212. H. J. Carter in 1861, Ann. & Mag. Nat. Hist. ser. 3, vol. viii. p. 457 &c., had already reviewed and added to the history of the species as known at that date. So that we now know:—

Patellina simplex, P. & J. Tertiary, Grignon, near Paris.
—— *semiannularis*, P. & J. Tertiary, Grignon; and Recent, Australia.
—— *corrugata*, Williamson. Recent: British, Arctic, Mediterranean Seas.
—— *annularis*, P. & J. Recent: Melbourne.
—— *cretacea* * (*Cyclolina*, d'Orb.). A flat form. Cenomanian (Lower Cretaceous): Ile Madame, Dépt. Charente-Inférieure, France.
—— *lenticularis* (Blumenbach). Cenomanian: Perte-du-Rhône, Dépt. Ain; St.-Paul-de-Fenouillet, Dépt. Aude. Aptian: Dépt. l'Isère (*Gras*). Upper Greensand (Lower Cretaceous): Haldon Hill and Milber Down, in Devonshire. Cretaceous (?): S.E. coast of Arabia (*Carter*).

* Ann. & Mag. Nat. Hist. July 1860, p. 36.

Patellina concava (Lamarck) *. Cenomanian: Dépt. Sarthe, France.
—— *plana* (d'Archiac) †. Cenomanian: Fouras, Dépt. Charente-Inférieure.
—— *mamillata* (d'Arch.) ‡. Cenomanian: Fouras.
—— *conica* (d'Arch.) §. Cenomanian: Fouras &c.
—— *conoidea* (Gras) ‖. Upper Neocomian.
—— *discoidea* (Gras) ¶. Aptian: les Ravix, la Fâ, le Rimet, Dépt. l'Isère.
—— ? *gigantea* (d'Orb.) **. A concavo-convex form; 10 centimètres broad. Senonian (Chalk): Royan and Pérignac, Dépt. Charente-Inférieure.
—— spp., Carter ††. Cretaceous (?): S.E. coast of Arabia. Tertiary: Sinde, and the Valley of Kelat in Beloochistan.
Conulites Cooki, Carter ‡‡. Tertiary: Scinde and Valley of Kelat.

Patellina plana (d'Arch.) and *P. discoidea* (Gras) are probably one and the same flat variety of *P. lenticularis*; and *P. mamillata* (d'Arch.), *P. conica* (d'Arch.), and *P. conoidea* (Gras) are possibly the same as *P. concava* (Lam.).

Quenstedt in his 'Petrefaktenkunde' &c. refers to *Patellina* (*Orbitulites*) *lenticularis*, p. 357, pl. 155. f. 64, from the "Gault," Perte-du-Rhône; *Patellina* (*Orbitulites*) *concava*, p. 359, pl. 155. f. 65, from the "Chloritic Chalk," Escragnolles.

V. FORAMINIFERA OF THE CHALK OF ENGLAND.

(See pages 10–16.)

The Foraminifera of the Chalk are so easily obtained in England, and so many English specimens from the Chalk-marl and the Chalk are in the British Museum, that it has been thought advisable to give a full list of the known species, and to indicate therein those which are now in the National Collection. This list of species, preceded by some general remarks on the constitution of Chalk, here follows:—

Note on the Foraminifera of the Chalk. By T. Rupert Jones, F.R.S. Chiefly from the second edition of Dixon's 'Geology of Sussex,' 1878.

Foraminifera are very abundant in the Chalk; indeed they constitute a large proportion of its material; Mr. H. C. Sorby, F.R.S., has estimated that in some specimens of chalk the shells and fragments of *Globigerinæ* form 90 per cent. of the bulk. Coccoliths §§, and sometimes Rhabdoliths, which are still smaller calcareous organisms, form the finer material of the Chalk. The microscopic prisms of *Inoceramus*-shells sometimes occur in such abundance as to make up a large proportion of the Chalk in places; and Sponge-spicules often abound. Foraminifers and Coccoliths are always present. The former belong to such kinds as at the present day live in the sea, from shallow water, near the shore, down to depths of about 100 fathoms. Some of them, however, exist now at great

* Hist. Anim. s. Vert. vol. ii. p. 197. no. 4 (1816); Ann. & Mag. Nat. Hist. ser. 3, vol. vi. p. 37 (1860).
† Mém. Soc. Géol. France, vol. ii. 1837, p. 178.
‡ *Op. cit.*
§ Mém. Soc. Géol. France, vol. ii. 1837, p. 178.
‖ Catal. Corps organis. foss. Dépt. de l'Isère, par M. Albin Gras. 8vo, Grenoble, 1852, pp. 33 & 37, pl. 1. figs. 4–6.
¶ *Op. cit.* pp. 37 & 52, pl. 1. figs. 7–9.
** Prodrome de Paléontologie stratigraphique, vol. ii. (1850), p. 279. no. 1350 Ann. & Mag. Nat. Hist. July 1860, p. 35.
†† Ann. & Mag. Nat. Hist. ser. 3, vol. viii. pp. 459 &c.
‡‡ Ann. & Mag. Nat. Hist. ser. 3, vol. viii. p. 457, pl. 15. fig. 7.
§§ One form of Coccoliths, termed Discoliths by Huxley, was observed and figured by the late Rev. J. Reade in Mantell's 'Wonders of Geology,' 1st edit., and p. 953, 7th edit.

oceanic depths; but the abyssal *Globigerinæ* of the present oceans grow much larger and coarser than those of the Chalk. A. d'Orbigny and others have speculated on the possible continuity of the Cretaceous Ocean with the Atlantic of the present day; but the hypothesis has been carried too far. See also 'Geol. Sussex,' 2nd ed., p. 124, and Ann. & Mag. Nat. Hist. ser. 4, vol. ix. pp. 295–96.

The Foraminifera of the Chalk and Chalk-marl of the continent have been described and figured by Ehrenberg, Alcide d'Orbigny, F. A. Roemer, Fr. von Hagenow, A. von Reuss, A. Alth, F. Karrer, and others; but the English series has not yet been taken completely in hand, though Ehrenberg [1], d'Orbigny [2], Williamson [3], Mantell [4], Eley [5], and others have illustrated some portions of this foraminiferal fauna. The Foraminifera of the Chalk of Antrim, Ireland, have been noticed by Professor Ed. Hull, F.R.S., and Mr. Joseph Wright, F.G.S., in cooperation with myself.

The distribution of one important division of the Foraminifera in the Cretaceous deposits is treated in detail by Professor Parker and myself in our memoir "On the Foraminifera of the Family Rotalinæ (Carpenter) found in the Cretaceous Formations," Quart. Journ. Geol. Soc. vol. xxviii. 1872, pp. 103–131.

Remarks on *Nodosariæ* and *Cristellariæ*, so common in the Chalk, and a classification of the Foraminifera, comprising the fossil forms as far as known at the time, are offered in the 'Monthly Microscopic Journal' for February 1876, pp. 89–92 and 200.

The Foraminifera of the Chalk of Ireland (Antrim &c.) are enumerated by Mr. J. Wright in the 'Report and Proceedings Belfast Nat. Field-Club,' new ser. vol. i. pt. 1, 1875, pp. 82–88, and pp. 91–96; and those of the English Gault and (Upper) Greensand are catalogued in the Appendix to Mr. Topley's 'Memoir on the Weald,' Geol. Surv. Mem. 1875, pp. 423, 424.

Further, the Foraminifera and other Microzoa observable in the Chalk of the Hebrides are noted by myself in a memoir by Prof. Judd in the Quart. Journ. Geol. Soc. vol. xxxiv. 1878, p. 739.

The flint-nodules so frequent in the Chalk contain shells and casts of Foraminifera in great numbers, with different degrees of conspicuity, either in their mass or on their surfaces. Having been just so much chalk-mud or calcareous ooze as their individual bulk represents, changed by the pseudomorphic action of water carrying silica in solution, removing the carbonate of lime and replacing it with silica, they contain just what organisms (Foraminifera, Sponge-spicules, Echinoderms, Shells, Fish-remains, &c.) were present in that deposit. See Proc. Geol. Assoc. vol. iv. 1876, p. 439, &c., where numerous authors are referred to; later memoirs also by Sollas, Wallich, and others have been published.

The beautiful series of flint specimens from the Rev. H. Eley's collection, enumerated at pp. 14–16, exemplify these remarks.

Foraminifera of the Chalk and the Chalk-marl of England.

Cm. stands for *Chalk-marl* and C. for *Chalk*.

The mark * indicates that the species from the *Chalk-marl* is in the British Museum; † indicates that the species from the *Chalk* is in the British Museum.

Family Miliolida.

Miliola, sp. C.†

[1] Monatsber. Akad. Berlin, 1838, p. 193; Abhandl. 1838, pp. 92, 133, &c.; Mikrogeologie, 1850, pl. 28; Ann. & Mag. Nat. Hist. ser. 4, vol. ix. 1872, p. 297, &c.

[2] Mém. Soc. Géol. France, 1840, vol. iv. part 1; Ann. & Mag. Nat. Hist. *tom. cit.* p. 294, &c.

[3] Manchester Lit. Phil. Soc. Mem. vol. viii. 1847, and ser. 3, vol. v. 1872.

[4] Phil. Trans. part iv. for 1846, p. 465, &c. Notices and figures in the 'Wonders of Geology' and 'Medals of Creation,' various editions.

[5] 'Geology in the Garden,' 1859; Geol. Mag. vol. ix. p. 124.

Fam. Lituolida.

Trochammina cretacea (*Reuss*). Cm., C.†
Webbina rugosa, *d'Orb.* Cm.
Lituola (including Haplophragmium) nautiloidea (*Lamarck*).†
Lituola (including Haplostiche) irregularis (*Roemer*). C., Cm.†*
Placopsilina (fixed Lituola) cenomana, *d'Orb.* Cm., C.*†
—— (large form, Bdelloidina?). C., Cm.

Fam. Lagenida.

Ramulina aculeata (*d'Orb.*). Cm., C.†
Nodosaria affinis, *Rss.* Cm.
—— anglica, *Ehrenb.* (near ovicula, *d'O.*). C.†
—— humilis, *Rss.* Cm.
—— limbata, *d'O.* C., Cm.†
—— obscura, *Rss.* Cm., C.
—— ovicula, *d'O.* C.
—— paupercula, *Rss.* Cm.
—— radicula, *Linn.*, var. Cm., C.†
—— raphanus (*Linn.*). Cm., C.†
—— subulata, *Rss.* C.†
—— Zippei, *Rss.* Cm., C.†
Dentalina[1] affinis, *Rss.* Cm.
—— brevis, *Rss.* C.
—— communis, *d'O.* Cm., C.†*
—— gracilis, *d'O.* Cm., C.
—— linearis, *Rss.* Cm.
—— lineolata, *Rss.* Cm.
—— Lorneiana, *d'O.* Cm., C.
—— monile, *Cornuel.* C.
—— nodosa (?), *d'O.* Cm.
—— oligostegia, *Rss.* Cm.
—— sulcata, *d'O.* C.
—— sulcata (*Nilsson*). C.
Lingulina carinata, *d'O.*, var. C.
Vaginulina costulata (*Roem.*). Cm., C.†*
—— lævigata? (*Roem.*). C.
—— longa, *Ehrenb.* C.
Marginulina compressa, *d'O.* Cm.
—— elongata, *d'O.* C.
—— ensis, *Rss.* C.†
—— Roemeri, *Rss.* C.†
—— varicostata, *d'O.* Cm.
—— trilobata, *d'O.* C.†
Cristellaria cultrata (*Montfort*). C.†
—— navicula, *d'O.* C.
—— obsoleta, *Jones*, Cm.
—— ovalis, *Rss.* C.†
—— recta, *d'O.* Cm.
—— rotulata (*Lam.*). Cm., C.†*
—— triangularis, *d'O.* Cm., C.†*
Flabellina Baudouiana, *d'O.* Cm., C.
—— cordata, *Rss.* Cm., C.†*
—— elliptica (*Nilss.*). C.
—— ornata, *Rss.* Cm.
—— ovata, *Geinitz.* Cm.*
—— pulchra, *d'O.* Cm., C.
—— rugosa, *d'O.* Cm., C.†
Frondicularia angulosa, *d'O.* C.
—— Archiaciana, *d'O.* Cm., C.†
—— Cordai, *Rss.* Cm., C.*
—— elegans, *d'O.* C.†
—— inversa, *Rss.* Cm.*
—— mucronata, *Rss.* Cm.*
—— striatula, *Rss.* Cm., C.
—— tricarinata, *d'O.* Cm., C.
—— Verneuiliana, *d'O.* Cm., C.†

Fam. Polymorphinida. Rather rare.

Polymorphina acuminata, *d'O.* Cm.
—— Thouini, *d'O.* C.
—— Orbignii, *Zborzewski.* Cm., C.
—— ——, var. fusiformis, *Rss.* Cm.
—— ——, var. damæcornis, *Rss.* Cm., C.
Polymorphina Orbignii, var. horrida, *Rss.* Cm., C.*
Sagrina (Sagraina) rugosa, *d'O.* Cm.
Uvigerina tricarinata, *d'O.* C.†

[1] Some of the *Nodosarinæ* vary among individuals from the straight (*Nodosaria*) to the curved (*Dentalina*) form, without any other distinction; so that the latter name is used for convenience only, and not on zoological grounds.

Fam. BULIMINIDA. Common.

Bulimina brevis, *d'O.* Cm., C.†
—— intermedia, *Rss.* C.†
—— Murchisoniana, *d'O.* Cm., C.†
—— obliqua, *d'O.* Cm., C.†
—— obtusa, *d'O.* Cm., C.†*
—— ovulum, *Rss.* C.
—— Presli (*Reuss*, Ataxophragmium). Cm.
Bulimina variabilis, *d'O.* Cm.†
Bolivina biformis, *Eley.* C.†
—— obsoleta, *Eley.* C.†
—— punctata (?), *d'O.* C.†
Virgulina Hemprichii (*Ehrenb.*). C.
—— paradoxa (*Ehr.*). C.†
—— Schreibersii, *Czjzek.* C.

Fam. TEXTULARIDA. Very common.

Valvulina gibbosa, *d'O.* C.
Textularia aciculata, *d'O.* C.†
—— agglutinans, *d'O.* Cm., C.
—— aspera, *Ehrenb.* C.
—— Baudouiana, *d'O.* Cm., C.
—— fœda, *Rss.* C.†
—— gibbosa, *d'O.* Cm., C.
—— globulosa, *Ehr.* Cm., C.†
—— prælonga, *Rss.* Cm.†
—— pupa, *Eley.* C.†
—— striata, *Ehr.* C.
—— subangulata, *d'O.* C.
—— trochus, *d'O.* Cm., C.†*
Textularia turris, *d'O.* Cm., C.†*
Spiroplecta rosula, *Ehr.* C.†
Gaudryina pupoides, *d'O.* Cm., C.†
—— rugosa, *d'O.* Cm., C.†
Verneuilina Bronnii, *Rss.* Cm.
—— pygmæa (*Egger*). Cm., C.
—— spinulosa, *Rss.* C.
—— triquetra (*Münster*) [tricarinata, *d'O.*]. Cm., C.†*
Heterostomella aculeata (*Ehr.*[1]). C.
—— tumens (*Ehr.*). C.
Vulvulina pennatula (*Batsch*), var. C.

Fam. GLOBIGERINIDA. Very common.

Globigerina bulloides, *d'O.* C.†
—— cretacea, *d'O.* Cm., C.†
—— elevata, *d'O.* C.†
—— marginata (*Rss.*). C.†
Globigerina pelagica, *d'O.* C.
—— siphonifera, *Parker & Jones MS.*, Cm., C.
Sphæroidina bulloides? (*d'O.*). C.†

Fam. ROTALINA[2]. Common.

Planorbulina Haidingeri (*d'Orb.*). C.
—— Ungeriana (*d'O.*). Cm., C.
—— Clementiana (*d'O.*). Cm., C.†
—— Voltziana (*d'O.*). Cm., C.
—— (Anomalina) ammonoides[3] (*Rss.*). C., Cm.†*
—— (——) Lorneiana (*d'O.*). Cm., C.†
—— (Planulina) Ariminensis (*d'O.*). C.†
—— (Truncatulina) lobatula (*Walker & Jacob*). C.
Planorbulina (Truncatulina) Beaumontiana (*d'O.*). C.
Pulvinulina Micheliniana (*d'O.*). Cm., C.†
—— crassa (*d'O.*). C.
—— Cordieriana (*d'O.*). Cm., C.
—— Menardii (*d'O.*). Cm.
Rotalia umbilicata (*d'O.*). C.†
Calcarina Spengleri (*Gmelin*). C.†, very rare.

VI. NOTE ON THE FORAMINIFERA FROM THE CHALK OF THE NORTH OF IRELAND. (See page 16.)

Mr. Joseph Wright, F.G.S., gave in 1875 a list of the known Foraminifera from the Chalk of the North of Ireland. This was published in the 'Annual

[1] For this and others of Ehrenberg's species see Ann. & Mag. Nat. Hist. ser. 4, vol. ix. p. 301.
[2] For the Rotalina of the Chalk see Q. J. G. S. vol. xxviii. p. 104. See Dixon's 'Geology of Sussex,' 2nd edit., p. 286.

Report and Proceedings of the Belfast Naturalists' Field-Club,' 1875, new series, vol. i., Appendix, pp. 73 &c., and is here reproduced for convenience of reference by collectors and students.

Foraminifera from the Chalk of North Ireland (JOSEPH WRIGHT).

Trochammina cretacea, *Reuss.*
Lituola (Haplophragmium) inflata, *Rss.*
—— (Haplostiche) clavulina, *Rss.*
Lagena apiculata, *Rss.*
—— sulcata, *W. & J.*
Nodosaria glabra, *d'Orb.*
—— radicula (*Linn.*). 3-chambered, thick.
—— —— (*Linn.*), var. near *N. conferta.*
—— pyrula, *d'Orb.*
—— hispida, *d'Orb.*
—— raphanus (*Linn.*).
—— —— (*Linn.*), var. inflata, *Rss.*
—— —— (*Linn.*). Short coarse variety.
—— —— (*Linn.*). Small.
—— acicula, *Lam.*
—— (Dentalina) limbata, *d'Orb.*
Dentalina communis, *d'Orb.*
—— ——, *d'Orb.*, var. Lorneiana, *d'Orb.*
—— ——, *d'Orb.*, var. irregularis, *d'Orb.*
—— ——, var. Lilli, *Rss.*
—— ——, *d'Orb.* Exquisitely delicate variety.
—— ——, *d'Orb.*, var. emaciata, *Rss.*
—— pauperata, *d'Orb.*
—— Steenstrupi, *Rss.*
—— nodosa, *d'Orb.*, var.
—— marginulinoides, *Rss.* Subseptate variety.
—— ——, *Rss.* Cylindrical variety.
Frondicularia striatula, *Rss.*
—— angustata, *Nilsson.*
—— Verneuiliana, *d'Orb.*
—— Archiaciana, *d'Orb.*
—— tenuis, *Rss.*
—— inversa, *Rss.*
—— elliptica (*Nilsson*).
—— mucronata, *Rss.*, var.
Flabellina lingula, *von Hagenow*, var.
—— rugosa, *d'Orb.*
—— reticulata, *Rss.*
—— pulchra, *d'Orb.*
—— ——, *d'Orb.* Narrow neat variety.
—— ——, *d'Orb.* Smooth variety, with parallel sides.
Flabellina ornata, *Rss.*
Lingulina carinata, *d'Orb.*, var.
Marginulina glabra, var. elongata, *d'Orb.*
—— bullata, *Rss.*
—— radicula (*Linn.*).
—— seminotata, *Rss.*
—— raphanus (*Linn.*).
Vaginulina (Marginulina) trilobata, *d'Orb.*
—— (Citharina) harpa, *Röm.*, var. nov.
—— costulata, *Rss.*
—— ——, *Röm.* Variety thin and slightly curved.
Planularia, sp. Near *Planularia longa* Cornuel.
—— crepidula, *d'Orb.*, becoming Flabellina pulchra, *d'Orb.*
Cristellaria recta, *d'Orb.*
—— ——, *d'Orb.*, var. hamosa, *Rss.*
—— ——, *d'Orb.* Near *C. Bronni.*
—— rotulata (*Lam.*).
—— navicula, *d'Orb.*
—— triangularis, *d'Orb.*
—— (Saracenaria) italica, *Defrance.*
—— (——) ——, *Defrance.* Long subvariety.
Polymorphina damæcornis, *Rss.*
—— horrida, *Rss.*
—— fusiformis, *Römer.*
—— regina, *B., P. & J.*, var.
Uvigerina nodosa, *d'Orb.*
Globigerina cretacea, *d'Orb.*
—— bulloides, *d'Orb.*
—— ——, *d'Orb.*, var. nov. Heaped.
—— marginata (*Rss.*).
Pullenia quinqueloba, *Rss.*
Textularia gibbosa, *d'Orb.*
—— pupa, *Rss.*
—— sagittula, *Defrance.*
—— trochus, *d'Orb.*
—— turris, *d'Orb.*
—— ——, *d'Orb.* Short and thick variety.
—— fœda, *Rss.*
—— prælonga, *Rss.*
—— globulosa, *Ehr.*
Verneuilina triquetra (*Münster*).
Gaudryina rugosa, *d'Orb.*
—— pupoides, *d'Orb.*, var. prælonga, *Rss.*

Tritaxia triquetra (*Münster*).
Bulimina Presli, *Rss.*
—— ovulum, *Rss.*
—— brevis, *d'Orb.*
—— intermedia, *Rss.*
—— regularis, sp. nov., *Jones, MS.*
——, sp.
Virgulina tegulata, *Rss.*, var.
Bolivina decorata, sp. nov., *Jones, MS.*
——, sp.
Pleurostomella fusiformis, *Rss.*
Planorbulina exsculpta, *Rss.*
Planorbulina ammonoides (*Rss.*).
—— —— (*Rss.*). Var. with extra shell-growth.
—— crenulata (*Rss.*).
Truncatulina lobatula, *W. & J.*
Pulvinulina Micheliniana, *d'Orb.*
Rotalia orbicularis (*d'Orb.*), var.
—— vel Planorbulina? With each chamber symmetrically perforated.
Ramulina lævis, gen. et sp. nov., *Jones.*
—— brachiata, sp. nov., *Jones.*

VII. FORAMINIFERA OF THE LONDON CLAY FROM A WELL AT HAMPSTEAD HEATH. (See pages 19–21.)

The specimens from the London Clay of the Well at Hampstead (Wetherell Coll.) were collected many years ago (in 1833), and were described and figured by J. de C. Sowerby, in the 'Transactions of the Geological Society of London,' ser. 2, vol. v. p. 135, pl. 9. figs. 3–20. They were accompanied by other minute fossils, also described and figured at the same time. Some of these remain associated with the Foraminifera in the collection.

In the 'Geologist,' vol. vii. 1864, pp. 85–89, these Foraminifera were reviewed by Parker and Jones; and the nomenclature was determined as follows:—

Fig. 1. Cythere ("Cytherina barbata").
Fig. 2. Pollicipes.
Fig. 3. Dentalina Buchi, *Reuss.*
Fig. 4. —— elegans, *d'Orb.*
Fig. 5. —— spinulosa (*Montagu*).
Figs. 6, 7. Textularia (Verneuilina) communis (Clavulina, *d'Orb.*).
Fig. 8. Nodosaria Badenensis, *d'Orb.*
Fig. 9. —— raphanistrum (*Linn.*).
Fig. 10. —— raphanus (*Linn.*).
Fig. 11. Cast of the palette of a Teredo.
Fig. 12. Marginulina Wetherellii, *Jones.*
Fig. 13. Cristellaria cultrata (*Montf.*).
Figs. 14, 15. Planorbulinæ: varieties of Pl. Haidingeri (*d'Orb.*)
Fig. 16. Planorbulinæ: Pl. Akneriana (*d'Orb.*).
Figs. 17, 18. Planorbulinæ: varieties of Pl. Haidingeri (*d'Orb.*).
Fig. 19. Cristellaria italica, *Defr.* (Crist. Wetherellii, *Jones.*, Quart. Journ. Geol. Soc. xxii. p. 592).
Fig. 20. Quinqueloculina triangularis, *d'Orb.*
Figs. 21–23. Polyzoa &c.

VIII. NUMMULITES.

(See pages 21–26, 29–43, 45–52, 56.)

1. *Note on the Name "Nummulites."*

Lamarck and other French naturalists adopted, to a great extent, the plan of naming recent Foraminifers with the generic name ending in *ina*, and the fossil genera with the name ending in *ites*—as *Lenticulina* and *Lenticulites* &c.; and

Alcide d'Orbigny, having recognized recent specimens of the subgenus *Assilina*, changed the name "*Nummulites*" to "*Nummulina*" (Ann. Sci. Nat. vol. vii. p. 295). True Nummuline specimens also have been met with in recent state, still further fortifying his position, were it necessary to adhere to the nomenclatorial plan above mentioned. It could not, however, be carried out by its originators; and the two forms of the one name in some instances, as in the case of the *Orbitolites* and *Orbitolina*, soon meant and now mean two different genera —not merely the recent and the fossil forms respectively of one genus. In some cases one of the two words has become obsolete, as in the case of *Lituola* and *Lituolites*, *Spirolina* and *Spirolinites*, *Miliola* and *Miliolites*, to which last pair *Miliolina* has been added of late years.

The appellation *Nummulites*, which has given the word "Nummulite" for common use among geologists and others, has certainly the priority over *Nummulina*, whatever intention the older naturalists may have had of modifying the generic name had they had the opportunity of recognizing a recent specimen, as happened to d'Orbigny as above mentioned.

In 1801 Lamarck had only seen *Nummulites* in a *fossil* state (the generic name "*Camerina*" had already been given to them by Bruguière in 1792). When he wrote again, in 1804, he might have used *Nummulina* (in the sense indicated above) had he been so inclined; for Fichtel and Moll's recent *N. radiata* and *venosa** had been published; but he did not recognize these living representatives of the genus.

In the papers on the Nomenclature of the Foraminifera in the Ann. & Mag. Nat. Hist. 1859 &c., W. K. Parker and T. R. Jones retained d'Orbigny's name "*Nummulina*" in deference to his lead, and to the apparent intention of the earlier naturalists. It does not, however, now seem called for; or, at the most, it is only a conveniently synonymous term for the genus *Nummulites* on some occasions.

2. *Note on the English and Belgian Nummulites.*

By the late Philippe de la Harpe, M.D. &c.

[With painful regret we have received the sad intelligence of the decease of this amiable and talented palæontologist whilst this Catalogue is being printed. He died suddenly on February 25th in his fifty-second year.]

(*Copy.*)

"Sir,—I received four days ago the English Nummulites you kindly sent me by Prof. Renevier. They are most welcome, as you will see; and I return you my warmest thanks for them.

"I have examined the specimens; and I think you will be pleased in learning the results of my observations.

"(I.) *Bracklesham.*—There are seven of *Nummulites lævigata* and twenty-four of *N. Lamarcki*, which proportion is the reverse of that obtaining in France and Belgium. The *N. lævigata* differs from the type of Paris and Brussels, and shows some relation with *N. planulata* (the large specimens without central chamber), by the great height of the chambers. The *N. Lamarcki* shows some affinity to the *N. elegans* of Sowerby (the small specimens with central chamber).

"Is this to be explained by the geological level or stage in which the specimens are found at Bracklesham? From the zoological characters one should think that the English *N. lævigata* and *Lamarcki* lie in the upper third of the interval between the Belgian *N. lævigata* and *N. planulata*—for instance, at the top of the 'Paniselian,' or at the bottom of the 'Bruxellian Stage.'

* See Ann. & Mag. Nat. Hist. ser. 3, vol. v. pp. 105 & 106.

"(II.) *N. variolaria* from Stubbington, and

"(III.) *N. variolaria* from White-Cliff Bay, are exactly the same as the Belgian form. They belong to the *type* of the species.

"It is remarkable that among your specimens there is not a single *N. Heberti*, which species is nearly always the companion of *N. variolaria*. In Belgium and France, in the upper part of the *variolaria*-beds there is usually one per cent. of *N. Heberti*. In the lower beds (base of the "Laekenian") these are more numerous (up to 50 per cent.). Is it that the *Heberti* is totally absent, or that the number of the specimens you kindly sent me are still too few for strict comparison? This is an interesting question to solve.

"(IV.) My best thanks for the *N. Prestwichiana*, R. Jones. It arrives just at the moment to help me in the study of the Belgian *N. planulata*, var. *a*, vel *minor*, d'Archiac. This rare Nummulite, which I possess from Brussels, Jette, Wemmel, Laeken, Gand, and Briendareck in Belgium, is most polymorphic, but always different from *N. planulata*, Lam., and *elegans*, Sow. It shows the following varieties:—

"1. Type: size 2–3 millim.; shape irregular, lenticular, mucro in the centre, surface smooth. Wemmel and Jette.
"2. Var. *plicata*: size 1½–2 millim.; shape lenticular, depression in the centre, surface plicated. Gand.
"3. Var. *granulata*: size 1½–2 millim.; shape flat, surface granulated. Brussels, Park St. Gilles.
"4. Var. *minor*: size 1 millim.; lenticular, smooth, regular.
"5. Var. *Prestwichiana*: size 1–2 millim.; flat, smooth, regular.

"The spire is very nearly the same in all the varieties; the last is always much larger than the foregoing whorl. By its variations this species has affinities sometimes with the *N. variolaria*, sometimes with *Assilina*, sometimes with *Operculina*. The difficulty now is what name to give to it.

"You are the only one that has described and named it. The English specimens, however, are the most distant from the Belgian type.

"To take the English ones for a type is impossible; they are so different from the majority that some palæontologists would even consider them as a separate species. To transfer the name of *N. Prestwichii* to different forms as varieties of the same species, I cannot do without your permission. In fact I see only two ways of solving the question: either we can call the whole species *N. Prestwichii*, R. Jones, and the English specimens var. *planissima*; or we can call it *N. Wemmellensis*, as M. Vanden Broeck has suggested; and then we have the name "*Prestwichiana*" to designate the variety you describe (Quart. Journ. Geol. Soc. vol. xviii. p. 93). You will kindly decide the question.

"I am now working out the Belgian Nummulites. I find in that country eight species, very distinct, and easy to separate.

I.
1. *N. planulata*, Lam., without central chamber, = *N. planulata*, var., d'Arch., the large species.
2. *N. elegans*, Sow., with central chamber, = *N. planulata junior*, d'Arch.

II.
3. *N. lævigata*, Lam. (type, and vars. *scabra*, *rotula*, *globularia*), without central chamber.
4. *N. Lamarcki*, d'Arch., with central chamber.

III.
5. *N. Heberti*, d'Arch., without central chamber.
6. *N. variolaria*, Sow., with central chamber.

IV.
7. *N. Orbignyi* (*Operculina*, Galeotti), without central chamber.
8. *N. Wemmellensis* (or *Prestwichii*) = *N. planulata*, var. *a*, vel *minor*, with central chamber.

"They make four pairs, of two species each, one species being without, the

second with the central chamber. That is the common rule. Except in the second pair, the larger species without central chamber is always much less numerous.

"As far as I know, *N. Heberti* and *Orbignyi* have not yet been observed in England. I should be very much surprised if they do not exist in the same beds with *N. variolaria* and *Wemmellensis* (*Prestwichii*). Their absence would be a remarkable exception to the general law of the distribution of the Nummulites, according to which, the *characteristic species of a bed are always two, of the same zoologic group, of which the larger has no central chamber and the smaller always has one*: examples:—*N. perforata* and *Lucasana*, *Brongniarti* and *Molli*, *complanata* and *Tchihatcheffi*, *Assilina exponens* and *mamillata*, *spira* and *subspira*, *granulosa* and *Leymeriei*, *N. contorta* and *striata*, *Biaritzensis* and *Guettardi*, &c."

[Here follows an offer to examine all the English species of Nummulites at some early opportunity, if hand-specimens of the containing beds be carefully collected and forwarded.]

"I send you together with this letter two papers:—one on the Nummulites of Nice and the neighbourhood, followed by an 'Echelle des Nummulites,' or Table for the Stratigraphical Distribution of the Species.

"The second is a description of the species from the upper beds of Biaritz.

"Believe me, Sir,

"La Provence, Lausanne, Switzerland, "Yours most obediently,
"1st October, 1879." (Signed) "PHIL. DE LA HARPE, M.D."

The results of our deceased friend's examination of the English and Belgian Nummulites, as above given, are of great interest; and the enumeration of the specimens at pages 22–25 and 35 of the Catalogue has to be studied with the light thus thrown on them.

The proposed specific name "*N. Wemmellensis*" for the type to which my "*N. planulata*, var. *Prestwichiana*" evidently belongs, has such strong justification that I acceded to the acceptation of my friend Vanden Broeck's suggestion. Still, for convenience, the term "*Prestwichiana*" has been frequently entered in the Catalogue, as a synonym.

The clear-sighted differentiation and grouping of the pairs of Nummulites, having large and small primordial chambers, respectively, carries out to a practical result the observations made in the 'Annals and Mag. Nat. Hist.' September 1861, p. 233. Many notes on the condition of the first or central chamber will be found in the list of the Egyptian, Crimean, and other Nummulites, in the Catalogue.

The sorrowful loss that relatives and colleagues have suffered by the death of Philippe de la Harpe is deeply felt also by palæontologists, who had full hope of reaping great benefits from his scientific industry and experience.

IX. THE FOSSIL FORAMINIFERA OF MALTA AND THE WEST INDIES.

As the distribution of the Foraminifera in these two widely separate areas of Miocene Deposits is of great interest, we annex the following Table:—

	Malta†	Trinidad‡	Antigua§	Jamaica‖											
				Hopewell, Metcalfe.	Orange River, Metcalfe.	Brimmer Hall, St. Mary.	Preston, St. Mary.	Carron Hall, St. Mary.	Crofts, Clarendon.	Clarendon.	Vere.	St. Thomas.	South-Hall Cliff.	Pteropod Marl.	Unknown localities
Vertebralina striata, *d'Orb.*	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
Alveolina, sp.	...	...	...	...	...	...	...	...	*						
Lituola Soldanii, *J. & P.*	*	...	...	...	...	...	...	...	...	...	...	...	...	*	
Nodosaria raphanus (*Linn.*)	*	...	...	...	...	...	...	...	...	...	...	...	...	*	
—— raphanistrum (*Linn.*)	*	*	...	...	...	...	...	...	...	...	...	...	...	*	
—— (Dentalina) acicula, *Lam.*	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
Lingulina costata, *d'Orb.*	*														
Vaginulina striata, *d'Orb.*	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
—— legumen (*Linn.*)	...	...	...	...	...	...	...	...	...	...	...	...	*		
Frondicularia complanata, *Defr.* (var.)	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
Cristellaria calcar (*Linn.*)	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
—— cassis (*F. & M.*)	*														
—— cultrata (*Montf.*)	*	...	...	...	...	...	...	...	...	...	...	...	...	*	
—— rotulata, *Lam.*	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
—— italica (*Defr.*)	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
Textularia Barrettii, *P. & J.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cuneolina pavonia, *d'Orb.*	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
Bulimina ovata, *d'Orb.*	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
Globigerina bulloides, *d'Orb.*	...	...	*												
Discorbina, sp.	...	*													
Tinoporus (Gypsina), sp.	...	...	...	...	...	...	...	...	...	...	*				
—— vesicularis (*P. & J.*)	...	...	...	...	...	...	...	...	...	...	...	...	...	*	
Orbitoides Mantelli (*Morton*)	*	...	...	*	*	...	...	*	...	...	...	*			
—— ——, var. orakeiensis, *Karrer*	...	*	*												
—— dispansa (*Sow.*)	...	...	*	...	...	...	...	...	...	...	...	*			
—— media, *d'Arch.*	...	...	...	...	...	...	...	...	...	...	...	*			
—— Fortisii, *d'Arch.*	...	...	...	...	...	...	...	?	...	...	...	*			
—— papyracea (*Boubée*)	*	...	...	...	...	...	...	?	...	...	...	?			
Heterostegina depressa, *d'Orb.*	*	...	...	...	...	...	...	...	...	*					
Operculina complanata (*Defr.*)	...	...	...	...	...	*	*								
Amphistegina vulgaris, *d'Orb.*	*	...	...	...	...	...	...	...	...	...	...	...	...	...	
Nummulites Rouaulti (*Defr.*)	...	...	...	...	?	?	?	...	...	...	...	*			
—— Ramondi (*Defr.*)	...	*	*	...	*	*	*	...	...	...	...	*			

† Geologist, vii. p. 155; Geol. Mag. i. p. 104, iii. p. 151. ‡ Quart. Journ. Geol. Soc. xxii. p. 5
§ Geol. Mag. i. p. 102, &c. ‖ Geol. Mag. i. p. 104, &c.; Ann. Soc. Malacol. Belg. xi. 1876.

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